NATIONAL TRANSPORTATION SAFETY BOARD

IN RE:	
THE EL FARO INCIDENT OFF THE COAST OF THE BAHAMAS ON OCTOBER 1, 2015	NTSB Accident No. DCA16MM001

Interviews of: EUGENE VAN RYNBACH
SPENCER SCHILLING

Thursday,
January 28, 2016

Herbert Engineering Corporation
Annapolis, Maryland

BEFORE:

ERIC STOLZENBERG, NTSB
MICHAEL KUCHARSKI, NTSB
JEFF STETTLER, USCG

This transcript was produced from audio provided by the National Transportation Safety Board.

APPEARANCES:

On Behalf of Herbert Engineering Corporation:

WILLA FRANCE, ESQ.

On Behalf of TOTE Services:

DENNIS O'MEARA

On Behalf of ABS:

THOMAS GRUBER

T A B L E O F C O N T E N T S

P-R-O-C-E-E-D-I-N-G-S

10:15 a.m.

MR. STOLZENBERG: On the record. Good morning. My name is Eric Stolzenberg. I am an investigator with NTSB, Office of Marine Safety. This interview this morning is in regard to the El Faro sinking.

Today is January 28th. It's about 10:15 a.m. We're at the Herbert Engineering Offices in Annapolis. We are here to interview Mr. Eugene van Rynbach and Spencer Schilling regarding the aforementioned accident.

Mr. Schilling, could you spell your name for the record?

MR. SCHILLING: This is Spencer -- The name is Spencer, S-P-E-N-C-E-R, and Schilling is S-C-H-I-L-L-I-N-G.

MR. STOLZENBERG: And, Mr. van Rynbach, could you also spell your name for the record?

MR. van RYNBACH: Yes. Eugene, E-U-G-E-N-E, van Rynbach, V-A-N R-Y-N-B-A-C-H.

MR. STOLZENBERG: Thank you. And I'd also like to go around the rest of the table here at the conference room. We'll go in a clockwise direction.

MR. FRANCE: This is Willa, W-I-L-L-A,

France like the country, F-R-A-N-C-E, attorneys for Herbert Engineering, just sitting in today.

MR. O'MEARA: Dennis O'Meara, D-E-N-N-I-S O'M-E-A-R-A. I'm representing TOTE Services.

MR. GRUBER: Tom Gruber, T-H-O-M-A-S G-R-U-B-E-R, representing ABS.

MR. STETTLER: My name is Jeffrey Stettler, J-E-F-F-R-E-Y, Stettler, S-T-E-T-T-L-E-R. I'm a civilian with the U.S. Coast Guard. I'm a member of the Stability Instructions Group for the Naval Architectural Group.

MR. STOLZENBERG: And on the phone.

MR. KUCHARSKI: Good morning, everyone. This is Michael Kucharski, Group Chairman, NTSB for the El Faro Nautical Operations Group. Spelling, M-I-C-H-A-E-L K-U-C-H-A-R-S-K-I.

MR. STOLZENBERG: Okay. Thank you. That's everybody.

Just to go over it again, NTSB is an independent Federal agency. We're charged with determining the probable cause of transportation accidents and promoting transportation safety.

We're not part of the Department of Transportation. We are not part of the United States Coast Guard. We have no regulatory or enforcement

powers. Really, what we do is make recommendations to people like the Coast Guard, DOT and/or companies and others.

The purpose of this investigation is to increase safety. It's not to assign fault or blame or liability. However, we cannot guarantee confidentiality or immunity from any legal or licensed actions.

As I mentioned earlier, we would like to record the interview. We are in fact doing so. I would just like to ask one more time on the record with Mr. Van Rynbach if you have a problem with the interview being taped.

MR. VAN RYNBACH: No.

MR. STOLZENBERG: And, Mr. Schilling, do you have an issue with the interview being taped?

MR. SCHILLING: No, I don't.

MR. STOLZENBERG: Thank you. As I said earlier, you'd be given an opportunity to review the transcript and suggest corrections for accuracy prior to release.

Interviewees can have a representative of your choice present. The representative may not testify for the interviewee. And the comments from the representative should be limited and objections are not

grounds for NTSB to refrain from asking questions.

I just ask. Do you have a person here who you are comfortable with and who is that person?

MR. VAN RYNBACH: Our representative would be Willa France.

MR. STOLZENBERG: Okay. Thank you. Please if we do ask questions, can you reply to the best of your recollection? If you don't understand a question, please ask to have it repeated. We are certainly here to repeat it. And if you later on realize you misstated or remember something else about a question, feel free to bring it back up and let us know we need a break. Let us know that's all okay to do so. If you don't know an answer to something, feel free to say "I don't know the answer to that."

All right. We'll start and we'll kick it off. We'll start with Mr. Schilling. What is your job title and your employer?

MR. SCHILLING: I'm President of Herbert Engineering and a Naval architect. And I've been with Herbert Engineering for 30 some years.

MR. STOLZENBERG: And can you briefly describe your marine experience up in those 30 years including Herbert Engineering in general, training and background?

MR. SCHILLING: It's been -- It's almost -- Well, bachelors degree in Naval architecture, marine engineering, a masters degree from UC Berkeley in naval architecture and ocean engineering. I've been with Herbert doing commercial ship design for 33 years.

MR. STOLZENBERG: And from day one with Herbert Engineering?

MR. SCHILLING: There was one employer before that for about a year, David J.C. Moore Limited.

MR. STOLZENBERG: Did you have a specialty over those 30 years?

MR. SCHILLING: Mostly stability and structures. In general, ship design.

MR. STOLZENBERG: Ship design and any Naval experience, U.S. Naval experience.

MR. SCHILLING: No.

MR. STOLZENBERG: Mostly commercial.

MR. SCHILLING: All commercial.

MR. STOLZENBERG: Commercial. Thank you.

And, Mr. van Rynbach, if you could.

MR. VAN RYNBACH: Sure, this is Eugene. I'm currently Vice President of Herbert Engineering, General Manager of the Annapolis office. I've been here since March of 2005.

Previous to that, I was approximately 20

years with the Container Ship Liner Company, sea/land service and its offshoot, U.S. Ship Management. Prior to that, I was a consultant working with my father. And I worked for early in my career ABS for two years in plan approval. I also have about two years of seagoing experience with a marine engineer's license.

MR. STOLZENBERG: Thank you.

MR. VAN RYNBACH: Also just on the education, I have a bachelors of science in mechanical engineering and naval architecture from the University of California and a masters degree in transportation management from SUNY New York.

MR. STOLZENBERG: All right. I guess whoever wants to field it just please say your name. I'm just looking for a brief history of Herbert Engineering Corporation. When was it started? What's its primary work?

MR. SCHILLING: Okay. The company was founded and started by Bob Herbert in 1963 in San Francisco. It was incorporated in 1973 as a California corporation. It's an employee owned company and has maintained its same basic structure since its origination. We've always been involved in commercial ship design, large commercial ships, container ships, tanker, bulk carriers, open hatch bulk carriers as one

of the earliest specialties. Always primarily working for owner and operators in design of new ships and support during maintenance and operations in ongoing vessel life issues.

MR. STOLZENBERG: Okay. Within those subsets, what does Herbert currently provide for commercial ships with regard to stability and then with regard to structure? What types of products are currently provided in general?

MR. SCHILLING: Well, the services we provide include initial concept design, preliminary design, basic design, new building acquisition support for ships, plan review. It would include all aspects of design, both stability, structures, marine engineering systems, outfit. We tended to focus on for container ships container securing systems and things like that as well.

MR. STOLZENBERG: Would you say that's a full service naval architecture firm then? The full gambit of services and products? You could provide a contract design for a large vessel.

MR. SCHILLING: Right. We don't produce production drawings. We don't have the staff to produce a full set of production drawings. Usually it's limited to the basic design and the basic class

approval drawings we might do. But we wouldn't do the detailed production drawings.

Sometimes on conversion projects, modifications for ships and whether it be machinery/mechanical system modifications or modifications for cargo arrangements and stowage, we might do detailed drawings that could be given directly to the shipyard.

MR. STOLZENBERG: Okay. But you would provide a packet to the shipyard where the shipyard would then produce all the detailed level drawings.

MR. SCHILLING: Right. So we wouldn't participate in that detailed production drawing.

MR. STOLZENBERG: Okay. Thank you. What products do you currently provided in regard to stability? I know there's a CargoMax program. But do you also provide T&S booklets? And I don't just mean to El Faro or TOTE. In general, do you provide this to operators?

MR. SCHILLING: Yes. We produce trim and stability booklets. We'll do intact damage stability studies. We'll do inclinings and that kind of thing.

We have a software company. That software company is the one that actually produces and develops and releases the software. The two main products there

are the CargoMax loading instrument. There's the shipboard trim and stability or stability and strength calculation tool that the master mates would use to verify stability in line with the trim and stability booklet. And we also, the company also, produces the HECSALV salvage response software for rapid response and it's also a design tool for doing it. So we used to do our ship design, our intact stability assessments, our damage stability assessments.

MR. VAN RYNBACH: This is Eugene. Spencer, you may want to mention that that's not a fully owned company by Herbert. It's a joint venture of 50/50 with the American Bureau of Shipping. And the name of the stability software company is called Herbert-ABS Software Solutions.

MR. STOLZENBERG: Okay. Thank you. I think we'll come back to the Herbert-ABS Solutions later as far as the makeup of it. So to be clear, if someone designs a T&S booklet or works on a T&S booklet and produces a T&S booklet from Herbert Engineering Corporation, is that separate and wouldn't interact with the software solutions group that produces a CargoMax?

MR. SCHILLING: Right. The trim and stability booklet whether it's completed for a new

building or revision to it for changes to ship, it would be done by Herbert Engineering by the engineering side. The software company when it produces the loading instrument would take whatever approved trim and stability booklet that's been prepared whether it's by Herbert Engineering or someone else to produce the loading instrument.

MR. STOLZENBERG: The loading instrument in the trim and stability booklet, does that use GHS? Does it use a CargoMax? Does it use a HECSALV or? Excuse my ignorance. I've never worked in any stability department for a large Naval arch firm. Is it -- What program is used to produce this T&S booklet?

MR. SCHILLING: If we're going to do the trim and stability booklet we would be using HECSALV to do the calculations.

MR. STOLZENBERG: On the Herbert side.

MR. SCHILLING: Right.

MR. VAN RYNBACH: You may want to spell HECSALV. That's H-E-C-S-A-L-V. This is Eugene.

MR. STOLZENBERG: HECSALV okay. Thank you. All right. I think we'll stay along these lines of thinking. If we look at a loading instrument versus a T&S booklet, are both of those required products for a large vessel, say a container ship like the El Faro?

Or is it dependent upon your customer and what they request?

MR. SCHILLING: The trim and stability booklet is definitely required. And the loading instrument is required now. In terms of the El Faro, if it was required, it depends on when the ship was built. It didn't used to be required for old ships back in the '60s and '70s because they didn't have them then.

And so the requirement for the El Faro I would have to look up. I don't recall if it was required to have one when it was installed.

MR. STOLZENBERG: Okay. And to help me, what is a loading instrument if you were going to describe it? What's the purpose of it? What does it do?

MR. SCHILLING: A loading instrument is just a computer program that should be basically implementing the loading guidance and stability information in the trim and stability booklet.

MR. STOLZENBERG: And that would be in the case of the El Faro the roll-on/roll-off cargo, the load-on/load-off container ships, fuel.

MR. SCHILLING: All the consumables and liquids, right.

MR. STOLZENBERG: All the consumables.

MR. SCHILLING: It shouldn't replicate the results of the trim and stability booklet. So any of the guidance in the trim and stability booklet for loading information should be replicated in the loading instrument.

MR. STOLZENBERG: Okay. I wanted to ask some questions about load lines, but I think since we've kicked off down this direction I'd like to go around the table and stick with this line. Sometimes in order to make this interview more smooth and cohesive it's better to bring everybody in and talk about a subject and then move onto another subject.

I think in this case it will be somewhat difficult because there's such a vast amount of specific information. But we'll do our best as we try to begin to understand some things. So I'll go around the table and ask if everyone else has questions on this. I'll start with Dennis.

MR. O'MEARA: Can you clarify? You said loading instrument covers what's in the T&S booklet from a stability booklet. So a loading instrument always covers stability and strength issues.

MR. SCHILLING: The loading instrument?

MR. O'MEARA: Yes.

MR. SCHILLING: Well, I'm hesitating only because as a older ship there weren't always strength requirements. So when we look at an old loading, it doesn't always have strength limits in it. It might just have stability.

And also sometimes when programs are produced, they covered strength. But stability wasn't required or wasn't approved. So it doesn't always have strength and stability. I think in this case both the stability and the -- Well, actually in the T&S booklet, it doesn't include strength values either. There's a separate document or separate guidance that would be given on longitudinal strength.

MR. FRANCE: This is Willa speaking. When you say this case, Spencer, you're talking about the El Faro.

MR. SCHILLING: For the El Faro.

MR. FRANCE: All right.

MR. SCHILLING: Correct.

MR. VAN RYNBACH: Yes, this is Eugene. Normally, the stability booklet, it was traditionally stability and then there was a separate document called the loading manual which had the strength information. But now they've tended to become integrated in the last 20 years. But at the time the El Faro was built in the

early ages, they were separate documents.

MR. STOLZENBERG: This is Eric Stolzenberg. So what you're saying, Eugene, what's allowed that confluence to occur, is that the powerful software that's since come into being that the loading instrument can incorporate structure and stability and loading?

MR. VAN RYNBACH: Yes. This is Eugene.

MR. SCHILLING: Yes, I think it was a requirement also -- this is Spencer -- about what was important for the specific ship design. Tankers and bulkers I think usually the loading instrument was to help for strength issues, checking, bending sheer force because that was the critical loading element. You know, it was critical for loading.

The stability was not really an issue for older tankers and bulk carriers. So the loading instruments didn't check stability. It was mostly for strength. Or if they did check stability for the T&S booklet, it wasn't necessarily even required to be approved for stability.

But these days it's more common as Gene said to have a document, a loading manual, that covers both in terms of stability and strength. And the loading instrument does both as well. And now these are both

approved when they're included in.

MR. VAN RYNBACH: This is Eugene again. They used to be separate hand calculations. So there were separate booklets. There are two different methods of calculating. Strength was calculated with a different method than stability.

With the advent of the computer, you had this one program, these loading programs like CargoMax that did it altogether. So then they brought the documentation together to match what the computer was doing.

MR. STOLZENBERG: Okay. This is Eric Stolzenberg. That's helpful to get back.

MR. VAN RYNBACH: Yeah.

MR. STOLZENBERG: Especially when you're talking about a ship that's been in service as long as the El Faro to see how things catch up. I appreciate that.

MR. STETTLER: Could I follow up on that?

MR. STOLZENBERG: Yes.

MR. STETTLER: Jeff Stettler. I just wanted to, Eugene, follow up. Are you aware of any requirements in that regard in terms of combining the two if there isn't a loading manual separate for example? You mentioned a trim and stability book and a

loading manual originally meant to address two different aspects of the vessel loading. Is there any requirement that both of those exist just to your knowledge?

MR. VAN RYNBACH: This is Eugene. Modern ships are required to have both. And they can be in the same manual. Normally, they are. But ABS rules require a ship to have a loading manual. It's in the longitudinal strength section.

The stability is separate. Stability actually was not traditionally in the ABS rules. It was SOLAS (phonetic) or different or the Coast Guard required it. ABS always required some sort of a strength calculation, at least, in modern years.

MR. STETTLER: Thank you.

MR. GRUBER: When you've produced a stability instrument or -- I'm sorry -- a loading instrument, how often is that updated?

MR. SCHILLING: You're talking specifically about the loading instrument.

MR. GRUBER: Yes.

MR. SCHILLING: Or the program. Typically, the loading instrument isn't updated unless the ship configuration changes. Something that would initiate a change in the trim and stability booklet or the loading

manual would also initiate a change in the loading instrument. But otherwise it wouldn't be updated because again nothing has changed in the official stability guidance to the vessel in terms of the trim and stability booklet. So there would be no need to update the program.

MR. GRUBER: Are there any other reasons that the program itself would be updated?

MR. SCHILLING: New revisions. I mean if there were software and hardware changes that made the particular program obsolete. Then it had to be upgraded to a new revision to run on new hardware and with a new operating system for instance. There might be updates to the program. It wouldn't necessarily change the content and calculations at that point. But it could be that it's a revision issue.

There might also be an owner could select to add features that were above and beyond what was required for basic stability and strength calculations to make it easier to find the loading conditions or to do other things that would help them in their loading analysis.

MR. GRUBER: Okay. Thank you.

MR. O'MEARA: This is Dennis. Could I just -- How are software products like CargoMax and HECSALV

validated or certified so that you know that the results that they're calculating are indeed true? How does that -- What is the process for configuration management on that so that you know that the software is actually producing correct results?

MR. SCHILLING: I'm getting a little bit over into what the software company does.

MR. O'MEARA: Yes.

MR. SCHILLING: For CargoMax. I can kind of reflect in general on those things because I used to be involved with CargoMax production years ago. But for each individual ship the loading instrument is submitted to Class for review and approval. And usually with that goes sample conditions that are run.

And I think it used to be checked against a second party tool, whether that was Class's tool or that was some additional secondary calculations. It could be just checked against in terms of stability booklet results. So if you ran the same sample if you look in the trim and stability booklet and get the same results, then it's confirmation that the program is giving the correct thing. And that's what Class or Flag would look at in addition to whatever they do internally with their own calcs to verify that the program is working correctly.

There's also type approval process from some classes that look at the code and look at the logic and look at the program in general and how the architecture is set up to verify that it can be approved on a case by case basis later.

MR. VAN RYNBACH: This is Eugene as well. I think if it's an approved loading instrument there's class approved test conditions. And then the ABS surveyor -- I think it's every year -- is supposed to go on board and have the ship run the computer and get the same results as the test conditions. So it's checked periodically by class I think every year to confirm that the computer is still working or the loading instrument is still working correctly.

MR. GRUBER: This is Tom Gruber. To follow up on Dennis' question, is there any confirmation to the actual ship's loading done to validate the program?

MR. VAN RYNBACH: I'm not sure. Could you repeat the question again?

MR. GRUBER: If you have a loading condition that's developed using the CargoMax, is it ever validated against the actual loading of the ship?

PARTICIPANT: Observed.

MR. GRUBER: The observed conditions to verify that the draft and the trim and the heel on the

ship are actually what's represented in the program output.

MR. SCHILLING: I'm not aware of validations that are done by class on that aspect. Normally, the calculations duplicate what's in the trim and stability booklet to the extent that the trim and stability booklet accurately represents what calculated drafts are compared to observed drafts. Then the loading instrument should give the same results.

If there are differences between calculated drafts and observed drafts that the operator is seeing in service, then we might be notified that there's some discrepancy or some issue and be asked to investigate what that might be. But I don't know if there's any check of the calculated versus an observed draft based on a loading condition that's done as part of the approval process.

MR. STOLZENBERG: May I just inject? Spencer, if you could slow down your answers a bit.

MR. SCHILLING: Okay.

MR. STOLZENBERG: Your head is cram packed with information. But whoever is going to be transcribing this is going to have some difficulty.

MR. SCHILLING: Okay.

MR. VAN RYNBACH: This is Eugene again. I

think normally the master checks the drafts before they depart. And they would possibly -- At least good practice would be to compare it to the calculated drafts. So that's sort of a check that's done with every departure.

MR. GRUBER: Tom Gruber again. So Herbert doesn't do an actual check against the condition. You would only do that if you were notified that there were discrepancies.

MR. SCHILLING: Right.

MR. GRUBER: Thank you.

MR. STOLZENBERG: This is Eric Stolzenberg. I would like to follow up on that just to be specific. Was there ever a notification for the El Faro to come and check that draft, observed draft versus calculated?

MR. SCHILLING: This is Spencer. I don't have a recollection of any. It doesn't mean it didn't have it. I just don't have a recollection of any. And I don't know if. Usually that query would go to software group to answer because they would be looking at the loading instrument and wondering why they observed the calculated drafts didn't match up.

So they would get that query first. It wouldn't necessarily come to Herbert Engineering. And I just don't know if they ever got a query on that.

MR. STOLZENBERG: So it would likely go to the software group first -- this is Eric Stolzenberg -- even though the T&S booklet comes from Herbert Engineering.

MR. SCHILLING: Right. Because the crew's not -- The crew's using the loading instrument, the program, to do the calculations. That's what they're actually comparing. Even though it's matching the T&S booklet, it's not referring and using the T&S booklet on a day to day basis. So if they're calculating drafts with their loading instrument and they're comparing those with observed drafts and there's an issue with it, they'll look at the loading instrument and look at the supplier and make the call to that support line.

MR. STOLZENBERG: Eric again. And my follow-up with that is who's the individual at Herbert-ABS Software Solutions who would be the contact person for this type of inquiry?

MR. SCHILLING: The gentleman I think that's knowledgeable about this particular program and ship is Mike Newton.

MR. STOLZENBERG: Okay.

MR. SCHILLING: The last name is spelled N-E-W-T-O-N. Whether he was the one who would have taken

any call from TOTE on this, I'm not sure. But he would I think be aware of any content.

MR. STOLZENBERG: Eric again. But he might be more familiar with the software side of the CargoMax and the HECSALV for the El Faro, more so than Herbert Engineering Corporation.

MR. SCHILLING: That's true.

MR. STOLZENBERG: Am I correct in saying that?

MR. SCHILLING: Yes, you are.

MR. STOLZENBERG: Okay. Thank you.

MR. STETTLER: Could I follow up with that? Jeff Stettler from the Coast Guard. So I just want to make sure I understand. The CargoMax as it develops the loading instrument has a model of the ship. I want to get into a little more detail perhaps later on that. But it is tested or it is validated against the trim and stability book, correct?

MR. SCHILLING: Correct.

MR. STETTLER: Okay. So if there's a question about CargoMax by the shipowner or the operator, I would think that would also then be where the observed condition doesn't match the CargoMax produced position. I would think then that would also be an observation that the observed condition is not

matching the trim and stability book.

MR. SCHILLING: Correct.

MR. STETTLER: So I would think that if there was a question about that that would also get back to (Inaudible) as well.

MR. SCHILLING: Yes. This is Spencer. Quite true in normal situations. So what might happen a call from the operator would be made to the CargoMax group and it would have an inquiry about observed drafts and a mention of calculated drafts. Can you help us figure out what's going on? We might evaluate, the software group might evaluate, load case to see if there were any obvious errors in entry of loading definition.

If they couldn't find anything out, they could come to Herbert Engineering, especially if we had done the trim and stability booklet and the loading manual and ask us if we had any insight to that and could offer things.

Even if we didn't do the T&S booklet, they might come to us to help us evaluate what's going on because it might require that an additional investigation be done. There could be an in service (Inaudible) survey that could be done or something like this if there were errors that needed to be tracked

down.

MR. STETTLER: Jeff Stettler again. So to your knowledge that was not done in the case of the El Faro.

MR. SCHILLING: I don't have any recollection of that.

MR. STETTLER: Okay. But that is a question we'd perhaps ask of Herbert Software Solutions to confirm that.

MR. SCHILLING: (Indicating)

MR. STOLZENBERG: You have to speak.

MR. SCHILLING: Yes, this is Spencer. Yes. I don't recollect if Herbert Engineering was ever involved in that sort of evaluation for the El Faro. And I don't know if Herbert-ABS Software Company was contacted regarding that.

MR. STOLZENBERG: Okay. Thank you.

MR. GRUBER: About the program itself, I have no further questions.

MR. STOLZENBERG: Do you have other questions, Jeff?

MR. STETTLER: I will have a bunch of questions that relate to CargoMax, but I think they're more detailed and its relationship to some of the other drawings and other things. Should we hold off on those

detailed questions?

MR. STOLZENBERG: I mean we will for a moment.

MR. GRUBER: I do have one question. You said that the software programs are developed by Herbert-ABS Company. How far back does that go? Can you tell us when that was created and what was there before that?

MR. SCHILLING: Right. Maybe I'll start at the beginning. The software was initially developed by Herbert Engineering as an internal software developed group. This is Spencer. That software group was in Herbert Engineering and was eventually split off into a separate company. And I don't recollect the actual dates, but it was probably I think in the early 2000's that it was split off into a separate company, wholly owned by Herbert Engineering. And they were responsible -- they took over all the code developing, marketing support, delivery to CargoMax, HECSALV and related software.

MR. GRUBER: The name of that company.

MR. SCHILLING: Oh, it was Herbert Software Solutions Inc., HSSI, I think. And then there was for a while we had a joint company called LMI, Load Master International, where we partnered with Kockumation in

Sweden. Kockumation is K-O-C-K-U-M-A-T-I-O-N.

And through that CargoMax and HECSALV continued to be produced. The code didn't change. We didn't migrate to the Kockumation platform. And then after three years, that partnership was just dissolved and it came back to Herbert Engineering ownership entirely as HSSI, Herbert Software Solutions, Inc.

And then I think four or five years ago that company took an investor partner in ABS as a 50 percent shareholder/owner. And that's when the name changed to Herbert-ABS.

MR. GRUBER: This is Tom Gruber. So that was around 2010-2011 time frame.

MR. SCHILLING: Around then, yes.

MR. STETTLER: Jeff Stettler. Just to clarify, is that considered a joint venture?

MR. SCHILLING: It's an LLC.

MR. STETTLER: LLC, okay.

MR. SCHILLING: Yes. And there are two partner owners. Both are 50 percent owners.

MR. STETTLER: Thank you.

MR. STOLZENBERG: This is Eric Stolzenberg. I think this is one of the topic areas I had was the Herbert-ABS Software Solutions relationship between Herbert Engineering Corporation and ABS. I think we'll

go around again including Mike on the phone if there are any questions on the relationship. I think you've covered the history of it right there. We'll hit that topic right now. I'll start with Jeff.

MR. STETTLER: Actually, I just thought about this. Which side of ABS? This is on the -- forgive me if I don't know the correct terminology. But ABS has a class side as well as a consulting, ABS Consulting. Is this with the ABS Consulting side or is this a different part of ABS, your LLC?

MR. SCHILLING: To be honest, I wasn't on the board when it was first -- this is Spencer -- formed. I would assume it's with ABS Group as the ownership side. I should clarify that the company is still operated by the same staff that was there before. It's not -- ABS is an investor partner in the company primarily.

MR. VAN RYNBACH: This is Eugene. Just to clarify, ABS Group is the consulting or the for profit part of ABS.

MR. STETTLER: That's what I was referring to, yes.

MR. VAN RYNBACH: ABS Classification is a nonprofit.

MR. STETTLER: Right. That's actually what

I meant. I just didn't know how to say it.

MR. SCHILLING: So ABS is not involved in the production for individual ships of the loading instrument. ABS staff or anything like that.

MR. STETTLER: Okay. Jeff Stettler again. Just to clarify or summarize perhaps, so the partner is the ABS Group which is the for profit side of ABS. Is that correct?

MR. SCHILLING: This is Spencer. That is my understanding.

MR. STETTLER: Okay.

MR. SCHILLING: I can confirm that, but that's my understanding.

MR. STETTLER: Thank you.

MR. STOLZENBERG: This is Eric Stolzenberg. To follow up on that, there to your knowledge are not ABS employees working at the office. It's the core team. ABS is an investor in the joint venture.

MR. SCHILLING: Right. Correct. This is Spencer. And the approval process for the loading instrument is carried out the way it's always been done. Submittal is through the class societies. And for ABS there are class approval stability group or their strength group. The same way the software company would be submitting to Lloyd's or GLMV

(phonetic), those kind of things.

MR. STETTLER: Jeff Stettler again. Spencer, I'm trying to remember back when that joint venture or the company was formed. Was there ever any intent or an effort to combine software in any way, some of the ABS related software suite with the Herbert Engineering software suites, HECSALV or CargoMax? Was there any effort made to bring those two suites together in any way?

MR. SCHILLING: This is Spencer. I think the intent was always to keep HECSALV and CargoMax produced the way they are, you know, by the software group and by the joint venture employees. There was never an intent to join it with Nautical Systems and all their software.

There was certainly interest and discussions about perhaps linking the software products together. It just made sense for -- Well, I'm speculating what ABS was interested in. But just they might have software that they would find helpful to link with any loading instrument and CargoMax being one of them might be useful to link with. But in terms of the code development and the production and all of the issues there was never an interest or a movement to bring them together.

MR. STETTLER: Okay. It was Nautical Systems that was the term I was recalling. But thank you.

MR. STOLZENBERG: Mike, any questions on the phone regarding this topic?

MR. KUCHARSKI: Yes. I wanted to go back about a half hour ago. Mr. Schilling, you stated you weren't sure if the loading instrument was required with the El Faro. Is that correct?

MR. SCHILLING: This is Spencer. I just don't recollect thinking back when it was initially put on if it was put on as a requirement class or it was developed at the request of then I guess SeaStar as an additional tool for the crew to be able to use to help them with loading. I just don't have a recollection of what the initiating issue was.

MR. KUCHARSKI: Okay. And is your basic understanding though if it goes through the approval process and it's on board then it has to comply with all the requirements at that time?

MR. SCHILLING: Yes. This is Spencer. Certainly now if it's on board the requirements for a loading instrument are that it has to be approved both for strength and stability. In the past, it wasn't necessarily the case that stability calculations had to

be approved that were in the loading instrument.

MR. KUCHARSKI: Okay. Great. And I think you also mentioned that -- Somebody asked the question about changes required update to the trim and stability booklet or manual. And you talked about that for a little bit. Do you know what triggers that for the revisions or updates to the trim and stability manual?

MR. STOLZENBERG: Generally now. Mike, are you talking generally or specifically for the El Faro?

MR. KUCHARSKI: For the El Faro.

MR. SCHILLING: I'm sorry. Again, this is Spencer. The question was what triggering events happened with regard to the El Faro that would require an update to the T&S booklet and the loading instrument.

MR. KUCHARSKI: Yeah, and are there any triggering events that required the addition of the fructose tanks or anything like that? Would that require an update to the trim and stability book?

MR. SCHILLING: This is Spencer. It would depend on the nature of the change. The things you look for are updates to light ship weight or to cargo stowage issues and things like that. And things like the fructose tanks, I would have to recollect what was done there. There should be --

MR. VAN RYNBACH: This is Eugene. I know a little more about that project. Those were portable tanks. So what was done is some foundations for mounting portable tanks and some piping connections were installed. They were not fixed tanks. They were ISO type container tanks. So I guess they could be treated as cargo.

MR. SCHILLING: Right. So if the weights can be entered in the existing cargo loading forms or weight forms either in the T&S book or the loading instrument, that wouldn't necessarily require a change to those and update.

PARTICIPANT: Would not.

MR. SCHILLING: Would not.

MR. STETTLER: This is Jeff Stettler. Are there any regulatory or other requirements that would define that definition that would allow that separation in terms of fixed foundations being considered cargo as opposed to part of the (Inaudible)? Eugene, you just made a definition I think.

MR. VAN RYNBACH: Yes.

MR. STETTLER: So are you aware of any requirement or definition in the regulations?

MR. VAN RYNBACH: This is Eugene. I think what's key is that the weight is included in the ship's

stability calculation. So if the master has a method of calculating that weight, that is important.

But the light ship weight normally is the fixed weight of the ship and its equipment. It's not related to things which are removal or portable or cargo related directly.

And then there is also some thresholds where you have to modify the stability booklet and something, weights of -- what is it -- one or two percent change in light ship weight and also change in the center of gravity. There's some standardized percentages where if you change the light ship by so much you have to redo the stability booklet.

MR. STETTLER: Could I just follow up with that? Jeff Stettler again. Eugene, the reason I bring this up is people have asked the question about these fructose tanks in particular.

MR. VAN RYNBACH: Yes.

MR. STETTLER: So I think I understand. So you were considering the tanks themselves as a cargo weight and indeed I believe TOTE in CargoMax included those in the variable load basically as a trailer.

MR. VAN RYNBACH: Yes.

MR. STETTLER: The fixed or semi-fixed portion of those systems though which included the

foundations and piping and pumping systems, etc., how was it intended by Herbert that those would be viewed, that portion of the system reviewed? Also as cargo?

MR. VAN RYNBACH: Those weights were too small to be measurable essentially.

MR. STETTLER: Okay.

MR. VAN RYNBACH: And I don't know. We're talking 10 tons, five tons, something of that order. So it's not an amount of weight that would trigger a requirement to revise the stability booklet. At some point, you have a 20,000 ton ship.

MR. STETTLER: Right.

MR. VAN RYNBACH: So five tons or 10 tons, it's a percentage which is so small that it's immeasurable.

MR. STETTLER: Yes, right. Thank you. Jeff Stettler again. I was just thinking more in terms of the loading instrument and how that weight was included in the loading instrument. Was there to your knowledge any guidance given to TOTE in terms of how they should include that weight, all of it, including the weight of the fructose cargo, the liquid cargo, in the tanks and their foundations? Was there any guidance given in terms of how they should account for that weight or not to your recollection?

MR. VAN RYNBACH: I don't -- this is Eugene -- recall that they raised that question.

MR. STETTLER: Okay. Thank you.

MR. GRUBER: Tom Gruber. Just to follow up on what you talked about the tanks being nonpermanent, the foundations were welded to the deck.

MR. VAN RYNBACH: Yeah, like little foundations -- I don't know -- six inches high, something. As I mentioned, these were ISO containment. So it has supports at four corners like a twist lock type support. So these were little stools six inches high or so for the container to rest on to distribute the load into the deck. And the containers were mounted on those.

MR. GRUBER: This is Tom Gruber again. How were they connected to the foundation? Was it a twist lock? Were they welded? Were they bolted?

MR. VAN RYNBACH: I think they were welded with a fill-it weld. The container was welded. I would have to check the drawing.

MR. GRUBER: Okay. So then there was no way to remove that. When they went into port, there was no way to take that container off and put it back on. So it wasn't semi-permanent. It was welded to the ship.

MR. VAN RYNBACH: It was welded to the ship,

but it could easily be removed. This was just temporarily put there. I think they were going to -- I don't know. They were going to maybe redeploy the ship and then they would maybe take them out.

So it was there because the sister ship had permanent, built-in tanks, the El Morro. And they were scraping that ship. So they needed a temporary method to carry fructose for a one or two year period.

I guess TOTE would know this better. I can't say for sure. This is just my recollection that they needed a temporary way to carry the fructose, something that could be easily removed in the future.

MR. STETTLER: Jeff Stettler. Can I just follow up that, Eugene? I think that may be one of the things that people are visualizing which is the fructose tanks on the El Yunque, the sister vessel.

MR. VAN RYNBACH: Yes.

MR. STETTLER: So I'm assuming based on what you're saying you handled the El Yunque system a little differently being that they were larger tanks, twice the capacity I believe, larger foundations, larger piping system. Was that system handled differently?

MR. VAN RYNBACH: This is Eugene. We were not involved in the fructose tanks for the other ships.

MR. STETTLER: Thank you.

MR. VAN RYNBACH: So essentially as I mentioned they were ISO containers. So they were like a cargo container. I think they were -- I don't remember the size, but they had a framework of the container.

MR. SCHILLING: The location -- this is Spencer -- displaced other roller trailers.

MR. VAN RYNBACH: Yes.

MR. STETTLER: Jeff Stettler again. So I think that's why some of this questioning. It's the connection between the similar systems on sister vessels versus the system on the El Faro.

MR. VAN RYNBACH: Yes. This is Eugene again. Those other ships had much more permanent installations. They were big cylindrical tanks. It was a different situation.

MR. STETTLER: Okay. Thank you.

MR. STOLZENBERG: Mike on the phone, do you want to follow up on this line or your earlier thoughts on the previous discussions?

MR. KUCHARSKI: No, I'm good. Thank you.

MR. STOLZENBERG: Okay. Since we broached the topic, one of the questions I have is what modifications to a vessel require a new dead weight survey or intact and damage stability assessments?

Does HEC determine that? Does the Coast Guard? Does ABS determine major modification? What definition applies?

If somebody could just give me a feel for what mods to a vessel to your knowledge would require new dead weight and stability assessments.

MR. SCHILLING: There's guidance from the Coast Guard that we would follow on what would be a minor and major conversion. And it usually involves changes to the primary ship dimensions, significant changes to cargo carrying capacity or significant weight changes, those types of things.

MR. VAN RYNBACH: This is Eugene. Or change of purpose of the ship.

MR. SCHILLING: Right. And that would be through when you're making the modification to the ship. That would be a consideration. And if there's a question about whether what you're doing is considered a major or minor conversion, you would field it to the Coast Guard or through Class to determine if that modification was so determined. And then other engineering and other changes might happen to be implemented as to whether it was a major conversion or not, what regulations might be implemented.

MR. STOLZENBERG: So if the modification was

being done to a vessel and a ship owner asked for that modification, would typically Herbert reach out to Class or Coast Guard early on to determine if it's going to be a major modification? Or is that something that would be at the latter end of a package? Just in general I'm asking and not just the El Faro.

MR. SCHILLING: It would usually be earlier on in the process -- this is Spencer -- in consideration of the project going forward because it could have larger implications on whether they want to do the project. It could impact the amount of engineering and the amount of conversion work that needs to be done and the cost.

It wouldn't necessarily and it's rarely Herbert Engineering that would contact the Coast Guard. Usually it's the owner that would make the official request or appeal to a determination.

MR. STOLZENBERG: And the owner -- this is Eric again -- would state what they generally intended to do.

MR. SCHILLING: Right.

MR. STOLZENBERG: And when you say the Coast Guard, is that the local OCMI typically? Is it the Marine Safety Center? Which branch of the Coast Guard does that type of appeal or request go to?

PARTICIPANT: If you know.

MR. SCHILLING: I don't because we don't normally write the letter.

MR. STOLZENBERG: Okay. Thank you. All right. And you also mentioned ABS. In the past, would Herbert reach out to ABS and ask for some guidance or what they believe might occur?

MR. SCHILLING: Not for an official ruling on it probably. I think it would go directly to the Coast Guard. We might ask their opinion of what they thought it might be.

MR. STOLZENBERG: And then at some point I imagine you could become aware of what that decision was.

MR. SCHILLING: Right.

MR. STOLZENBERG: And that would come back through the owner.

MR. SCHILLING: Right.

MR. STOLZENBERG: Okay. Thank you. One other question I had is often I hear two percent is a minimum before stability. But I also heard Eugene say earlier one percent. Can you just enlighten me on what one percent or two percent means and why is it kicked around with regard to modifications or stability, dead weight?

MR. SCHILLING: It relates to whether a new inclining that needs to be done to establish the vessel's light ship weight. And the Coast Guard has a NAVIC, Navigation Inspection Circular, that defines when a dead surveyor or an inclining needs to be done on a ship and when you're considering a modification or modifications have been done on the ship since the last inclining. When the aggregate weight change approaches two percent of the light ship weight, you have to start considering whether a new dead weight survey or a inclining needs to be done.

I think up to two percent you can rely on calculations. If the weight is significant, you can rely on calculations to update the light ship weight and the CG. If it's over two percent, you have to consider a formal dead weight survey to verify the light ship weight and LCG.

If after having done the dead weight survey which is just reading drafts and surveying the vessel for weights to add and deduct from light ship, you determine that the measured light ship weight agrees within I think one percent of the estimated light ship weight after you've added all the changes in. Then you can use the calculated VCG for the light ship center of gravity, vertical center of gravity.

If you don't meet or if your estimated light ship weight is more than one percent then the light ship should be determined from the dead weight survey. You have to go ahead and complete the inclining to determine the light ship VCG.

MR. STOLZENBERG: Okay. So if I understand it correctly, if a modification is made to a vessel that's either plus or minus two percent of its light ship weight, calculations are done. And a dead weight survey can be done. If the dead weight survey performed matches the calculations within one percent, then a new inclining does not have to be performed. If it's outside of that, then an inclining would have to be performed. Okay. Thank you.

MR. STETTLER: Can I ask a related question? Jeff Stettler. Could you state if you know under what condition or situation could you use inclining data from a sister vessel to determine light ship characteristics of another vessel?

MR. SCHILLING: That kind of thing is often done at new building stage for sister vessels. It depends on the type of vessel.

I don't recollect what regulation or requirement spells out when that's acceptable and when it can be used. Sometimes a dead weight survey is done

for all the vessels and they will apply the VCG to the sister vessel. Sometimes they'll apply both the light ship weight and the center of gravity to sister vessels. And sometimes they incline each individual vessel. I'm not sure if there's a regulation that specifies that specifically should be done.

MR. VAN RYNBACH: This is Eugene. I think when new ships are built, the builder applies to the Classification Society. And he requests that the first ship inclined dead weight and then the Classification accept that the sister ships built to the same plans.

Normally, it's just a dead weight survey. They just confirm that the light ship weight is similar to the first ship. And based on that, the Classification will allow them to use the vertical center of gravity from the first ship for the follow-on ships that are built essentially to the same drawings. So there is some sort of a ruling made to accept that.

MR. STETTLER: Jeff Stettler again. Eugene, is that a NAVIC or some other document that you're aware of?

MR. VAN RYNBACH: It could be in SOLAS as well and Load Lines. And it could be in Coast Guard. Probably Subchapter S, Stability.

MR. STETTLER: Okay.

MR. VAN RYNBACH: I don't know the regulation.

MR. STETTLER: Thank you.

MR. GRUBER: Tom Gruber. Just to go back, you talked about major modification requests going from the owner to the Coast Guard. Would the decision for dead weight or inclining or detailed weight calculation be made in the same manner? And, if not, how do you go about getting that determination?

MR. SCHILLING: On who checks whether the aggregate weight change is enough to implement, that can be a discussion depending on how the ship is classed and flagged and whether in U.S. it's an ACP sort of situation. That can be a discussion with Class where the weight changes. When a modification is done, Class will often ask the question "What's the total aggregate weight change?" And we'll indicate that a dead weight incline is required if you're approaching that two percent threshold.

MR. GRUBER: Tom Gruber, a follow-up. That's not connected to whether or not it's a major modification. You could still be required to do some kind of a stability test even if it's not a major modification.

MR. SCHILLING: That's correct.

MR. GRUBER: Thank you.

MR. STOLZENBERG: Dennis, anything?

MR. O'MEARA: No questions.

MR. STOLZENBERG: Mike on the phone along these lines?

MR. KUCHARSKI: I'm okay. Thank you.

MR. STETTLER: One very simple question, Eric, related. Jeff Stettler, Coast Guard. Do you know what year Herbert Engineering began work on the El Faro?

MR. SCHILLING: It would have been 2005.

MR. STETTLER: Five. Just before the modification.

MR. SCHILLING: That was our first job with it.

MR. STETTLER: Okay.

MR. SCHILLING: Was the conversion.

MR. STETTLER: So you didn't have any involvement in 2003 and 2004 time frame in any of the decisions or predesign/concept design related issues or modification -- I should say -- with the El Faro in preparation for that conversion.

MR. SCHILLING: This is Spencer. I don't recollect the precise date when we started. I mean I think our first involvement with the El Faro with the

Northern Lights at the time --

MR. STETTLER: Right.

MR. SCHILLING: -- was for this conversion. At what point we got into it with the discussion with TOTE and what they'd already done I don't recall.

MR. STETTLER: Okay. Thank you.

MR. STOLZENBERG: That falls into another topic I wanted to speak to briefly. What major products did Herbert Engineering provide for TOTE and SeaStar in general and over about what time frame? Briefly.

MR. SCHILLING: I mean I think -- this is Spencer -- the first thing I can recollect or find in our files really with involvement with TOTE at all is in early 2000-2001 maybe when we did some evaluation for them on their ORCA (phonetic) class containerships which they're currently getting designed by NASCO. So we did some early work with them on stability, damage stability, for those ships.

But up until then, we hadn't had any involvement with TOTE. And then I think this job on the Northern Lights was the first main project we had.

MR. STOLZENBERG: And earlier when you described what Herbert could handle, it was a vast array of Naval architecture marine services. What was

the nature of these products for TOTE and SeaStar?

MR. SCHILLING: Do you mean the projects?

MR. STOLZENBERG: Yes. What projects were they?

MR. SCHILLING: Well, again I think the -- I have to correct now because we're talking Northern Lights and that was 2005. In 2003, it was the Great Land would have been the first row-row. So the Great Land was a similar ship. And it went through the same deck container conversion.

MR. VAN RYNBACH: This is Eugene. Just maybe I can clarify a little bit. The Great Land was a candidate for this conversion initially. And then I think TOTE in 2005 switched to the Northern Lights.

The Great Land and the Northern Lights were two sister ships running between Tacoma and Alaska, Anchorage, Alaska for many years for TOTE. But then they built these replacement ships called ORCA class. We were coming on line. So these ships became surplus, the Great Land and the Northern Lights.

They needed an extra ship in this Florida to San Juan service. So the idea was to convert one of these to be the same as the two existing ships that were in that service. So they would have three ships all with the same configuration.

MR. STOLZENBERG: And the third ship being? This is Eric Stolzenberg.

MR. VAN RYNBACH: Well, there's the El Morro, El Yunque that were existing in those services. So the third ship would be either the Northern Lights or the Great Land. And in 2005 it became the Northern Lights which was renamed in early 2006 to El Faro.

MR. STOLZENBERG: Okay. Thank you.

MR. VAN RYNBACH: And just a little more follow-up because this office was more involved on some of the small projects for SeaStar. We periodically assisted them with evaluating deck strength for specific heavy cargo. When they carried a big cargo that weighed 50 or 60 tons, we would advise them on the securing/lashing of that cargo and whether the deck was strong enough.

We also designed a portable ramp so that they could carry military cargo, tanks and so forth. It turned out that there wasn't so much need for this ship in that service, the El Faro after it was converted. So it was -- TOTE can correct me on this -- offered into charter to MSC, the Military Sealift Command, from time to time. So they needed a portable ramp to carry military cargo. We designed that portable ramp for them. And we did one or two other

minor projects.

MR. STOLZENBERG: And that would be Herbert Engineering.

MR. VAN RYNBACH: That would be Herbert Engineering, yes.

MR. STOLZENBERG: And that would include the T&S booklet for the El Faro we talked about earlier.

MR. VAN RYNBACH: That's for the conversion in 2005-2006.

MR. STOLZENBERG: Okay. Thank you.

MR. VAN RYNBACH: A modification. It really wasn't a conversion, yes.

MR. GRUBER: Tom Gruber. Did you do any of the stability work on the El Morro and El Yunque for the Florida/Puerto Rico trade?

MR. VAN RYNBACH: No. This is Eugene. They had CargoMax programs. But we did not do the stability booklet.

MR. STOLZENBERG: This is Eric Stolzenberg again. So this speaks to what you both had mentioned earlier is that the CargoMax side, the Herbert Software Solution side, is a different entity than the Herbert Engineering side which does the T&S booklet. And even though you weren't doing the T&S booklets for the El Yunque and the El Morro, Herbert Software Solutions was

doing the CargoMax loading applications for those other vessels.

MR. SCHILLING: Yes. This is Spencer. That's correct.

MR. STOLZENBERG: Thank you. That makes it much clearer now. Any other questions along these lines?

MR. STETTLER: Jeff Stettler. I've got a related question. Who at TOTE, either organizationally or by name, did you typically interact with during the early, say, from 2005 to 2006? Who were your technical representatives at TOTE? Who did you deal with on technical matters?

MR. VAN RYNBACH: Do you want me to answer?

MR. SCHILLING: Yes.

MR. VAN RYNBACH: I can answer. This is Eugene. I can answer for SeaStar because at that period in time SeaStar was a separate entity that managed the ships in the Florida/Puerto Rico service. It started out as a joint venture between Matson and TOTE I believe. And then Matson no longer was involved at some point.

But it was still -- It had a separate president and a separate organization structure in Jacksonville, SeaStar Line. So most of our work was

with SeaStar Line and the people we worked with were William Weisenborn, W-E-I-S-E-N-B-O-R-N. He was like marine operations manager. And before him was Steve Tornello, T-O-R-N-E-L-L-O. And then there was Jim Coleman, C-O-L-E-M-A-N. He was the marine superintendent, the repair superintendent.

Those are the three people that we dealt with at SeaStar. We didn't deal that much with TOTE Tacoma. Normally, all our interactions were with Jacksonville.

MR. STETTLER: So all three of these then were from Jacksonville.

MR. VAN RYNBACH: Yes. And then I guess Dennis -- It was about 2009-2010 when TOTE decided to consolidate their operations into Tacoma. And so all the marine operations were not run so much out of Jacksonville. All those people I mentioned left SeaStar and TOTE in Tacoma took over direct management of those ships.

MR. STETTLER: Is there a particular organization or part of the organization in Tacoma that you interacted with even up through 2015 other than the port engineers? I guess that's really my question. Who else at TOTE other than the port engineers did Herbert Engineering interact with in dealing with trim

and stability books and general drawings and the like?

MR. SCHILLING: This is Spencer. I think in terms of the detailed engineering side most of it was handled by the staff in Jacksonville.

MR. STETTLER: Port engineer staff?

MR. SCHILLING: Or the manager staff that was down in Jacksonville. In Tacoma, two of the people we dealt with I think throughout our involvement with TOTE were Phil Morrell. The last name is M-O-R-R-E-L-L.

MR. STETTLER: He's in Tacoma.

MR. SCHILLING: Yes. And also we had some correspondence with Rich Griffith. But they weren't involved in the day to day aspects of the Northern Lights/El Faro modification. But we have dealt with them more recently on El Faro issues in projects they were considering doing.

MR. O'MEARA: This is Dennis. Phil Morrell is the VP for Marine Operations, commercial side. So he oversees both the west coast TOTE commercial stuff and the east coast stuff which would include Jacksonville and San Juan run. He has responsibility for that.

MR. STETTLER: Okay.

MR. VAN RYNBACH: This is Eugene. Just to

go a little more, after the operation moved more to TOTE Tacoma, we had less involvement with the ships. So the last five years we just had one or two projects, one being the fructose tanks.

Also I should mention that at one point we designed replacement ships for the Florida to Puerto Rico service for SeaStar. So we prepared like a concept design for new ships for them in 2010 and 2011. But then when this consolidated -- the SeaStar separate organization was ended, that project ended. And it was taken over by TOTE in Tacoma and then our involvement ended.

MR. STETTLER: Thank you. Jeff Stettler again. Just to follow up, what I'm after is I'm really trying to understand TOTE's organization. Do they have Naval architects for example or folks that you dealt with who understood ship stability matters and ship structure matters for example? Or were you the Naval architects for TOTE?

MR. SCHILLING: This is Spencer. On projects they asked us to work on, we would handle the stability and the strength issues. That's why they came to us, those kinds of things.

MR. STETTLER: Right.

MR. SCHILLING: But in terms of overall

oversight responsibility for stability and things like that for TOTE, that was not our role. So if there was a modification they asked us to make or something, we would make sure we checked what needed to be checked for stability or strength and things like that, get the drawings approved, do the calculations necessary to get the modifications done.

MR. STETTLER: So just to clarify as far as you know, did you ever work with a degreed Naval architect who was employed by TOTE?

MR. SCHILLING: This is Spencer. I don't have a recollection of working with a Naval arch at TOTE.

MR. STETTLER: Okay. Thank you.

MR. STOLZENBERG: This is Eric Stolzenberg. I'd like to follow up along the same lines. Did Herbert have an RRDA or the rapid response and damage assessment contract with TOTE or El Faro specifically?

MR. SCHILLING: No. This is Spencer. No, we did not.

MR. STOLZENBERG: Were you contacted after the sinking to do any stability work or assessments?

MR. SCHILLING: This is Spencer. Immediately after the report, our software group received a call from ABS RRDA group to help them answer

some questions about calculations that ABS's RRDA group was doing with HECSALV. That would be a normal support function that the software group would do. So if there's questions about what the software is doing or how to use it for a particular application, the software group would get a call from ABS RRDA group and the other salvage organizations that would be using it.

MR. STOLZENBERG: Okay.

MR. SCHILLING: And there was a call placed at that point. But there was no request for any analysis. We didn't do any analysis on the condition or anything like that and Herbert Engineering wasn't involved.

I heard when the phone call came in that there were some questions about the ship configuration at the time. So I offered to at least explain what the ship looked like to the ABS RRDA group because they hadn't personally seen it and were uncertain about the arrangement. So I got on the phone and at least explained to them about the arrangement of the El Faro and the row-row decks and the second deck and things like that. That was all.

PARTICIPANT: May I interrupt here just from an organizational issue? Would you like to have lunch? We would need to call ahead. Next door there's a

restaurant. So we can get a table there if you'd like. Do you want to take a break at 12:30 p.m.? It's 11:30 a.m. now. Or if you'd give me a time I can arrange lunch.

MR. STOLZENBERG: Yes. This is Eric Stolzenberg. I was thinking we would take a break because we're just over an hour anyways. And we'd go off the record and come back on the record once we clear a topic. So if we can clear this topic, we'll go off the record and discuss any arrangements in the afternoon.

PARTICIPANT: Okay. I'm sorry.

MR. STOLZENBERG: And we'll go from there. But, yes, thank you very much for the suggestion and we'll get there.

PARTICIPANT: Yes.

MR. STOLZENBERG: Any other questions on this topic here? At the table I'll start with.

MR. GRUBER: Tom Gruber from ABS. Just to clarify, the ABS Rapid Response RRDA team is part of the ABS Class, not the group of companies. So it's separate from the group and separate from the ABS Herbert joint venture.

MR. STOLZENBERG: Mike on the phone?

MR. KUCHARSKI: Nothing. Thank you.

MR. STOLZENBERG: Okay. What do you say we go off the record for five minutes and we'll come back on. We're going off. The time now is 11:31 a.m. Off the record.

(Whereupon, the above-entitled matter went off the record at 11:31 a.m. and resumed at 11:51 a.m.)

MR. STOLZENBERG: On the record. This is Eric Stolzenberg. It's 11:51 a.m. at Herbert Engineering offices in Annapolis. We're continuing with the interviews of Misters Spencer Schilling and Eugene van Rynbach.

This is Eric Stolzenberg. My question is does Herbert provide any products regarding the load lines? Or I know ABS and Class do load lines. What is the role of an independent naval arch firm with load lines for a Class vessel?

MR. SCHILLING: This is Spencer. We might work if an owner has a request -- Load line assignment comes from Class. We can provide engineering backup calculations and things like that to justify an increase if we feel one is deserved for a load line change or a load line assignment. But the load line assignment comes from Class or Flag administration.

MR. STOLZENBERG: Okay. How are hull openings treated in load line rules? Let me back up a

moment. Are you familiar with load line calculations and load line assessments?

MR. SCHILLING: Generally yes.

MR. STOLZENBERG: Okay. With that in mind, to your knowledge, how are openings in the hull treated for load lines?

And further to the point, a down flooding point to my knowledge is the first portion of the hull which will be submerged when a vessel keels over. So what I'm looking for is how are openings in the hull treated for load lines and if you're aware of the down flooding point for the El Faro or where we can find it.

MR. SCHILLING: This is Spencer. These ships have a standard B load line assignment. And I think as part of that down flooding point should have been noted as part of the load line assignment. But I don't know if there's a requirement of any calculations that go with that down flooding point.

As a standard B dry cargo ship, there would not have been any damage stability requirements as part of the load line calc.

MR. STOLZENBERG: What does a standard B refer to?

MR. SCHILLING: In the load line rules, there is type A and type B ships. Type A ships are

basically tankers. Type B is dry cargo and bulk and dry bulk carriers.

MR. STOLZENBERG: Okay. And if I could go back to the hull openings, what's the definition of a down flooding point to your knowledge with regard to load line assignment? Ask me to rephrase if I'm not being clear.

MR. SCHILLING: Well, there's protected openings and unprotected openings.

MR. STOLZENBERG: Okay.

MR. SCHILLING: The unprotected or non protected openings are ones which have no weather tight closure and usually the regulations, whether it's damage stability regulation or such, it cannot be submerged at -- Well, an unprotected opening has nothing to prevent the water from flowing down into the ship into a watertight compartment.

The weather tight opening is one that's protected by some sort of ball-check valve or other such things that prevents water from coming in when there's an occasional wave passing or rain or other water on deck from getting into the hull. But it will not take a head. So any head of water if it's permanently submerged equilibrium it's not watertight. It only prevents the occasional passing of water from

entering through that down flooding point.

Whereas, an unprotected opening has no protection whatsoever. So any occasional passing of water could enter the ship through that opening.

MR. STOLZENBERG: And then that would leave a protected opening and what is that?

MR. SCHILLING: A protected opening is not an opening at all. Essentially, it's a water-tight closure in compliance.

MR. STOLZENBERG: Okay. So that might be?

MR. SCHILLING: So a manhole or a bolted, proper watertight hatch or a cover plate or something like that.

MR. STOLZENBERG: Okay. With regard to the El Faro and the sister vessels we spoke of earlier, the ventilation openings on the side, what are those treated as for the load line to your knowledge?

MR. SCHILLING: I don't know if we've seen any list of down flooding points related to load line. It's our understanding that for the damage stability assessment the ventilation openings would be a point of down flooding for the survival criteria and the survival analysis.

MR. STOLZENBERG: You said would be?

MR. SCHILLING: There would be certainly.

The damage stability includes both the weather tight closure and an unprotected opening.

MR. VAN RYNBACH: This is Eugene. Many times with the load line certificate there is a reference document that lists all the openings on the freeboard deck whether they're protected. It lists all the vents and so forth.

The ship maybe because it's aged, I don't know. But that's typical. I don't know if you've found that document. It may be at ABS. It's usually associated with the load line. There's a reference document which lists all the vents on deck and all the openings.

MR. STOLZENBERG: Thank you. So in the case of the El Faro, we walked the sister vessel, the El Yunque. There are fire dampers on the ventilation openings for exhaust and inlet. What are those fire dampers typically -- What would those typically be included as in the load line? Is that weather tight, protected, unprotected or does it depend on their height above the water line or placement of the vessel?

MR. SCHILLING: This is Spencer. I think it depends on the nature of the damper itself if it can withstand an occasional passing of water without penetration. It doesn't have to support a head of

water. But normally for things like ventilation louvers like for instrument intakes and things like that, they would not be considered a protected opening, a weather tight opening. They would be considered an unprotected opening.

I'm not familiar with the particular types of fire dampers that are actually internal to this. That's why we would have considered just looking at the -- Well, considering these ventilation openings to our understanding the down flood point was controlled by an internal baffle above the actual or at the actual opening.

MR. FRANCE: Willa France. Just for clarification, this and these are referring to a sketch or a drawing for the El Faro. Yes?

MR. STOLZENBERG: That's correct. This is Eric Stolzenberg. We have a drawing on the wall of air holes number 2A and 3 from ABS. And we were looking at the typical -- This is a Sun Ship building drawing of ventilation arrangement of holes two and three, drawing number C6877-2A Alt. C.

MR. FRANCE: Great.

MR. VAN RYNBACH: Also just to clarify -- this is Eugene -- this drawing was modified when the ship was lengthened in 1993. So it also has a JJH

title block and with a similar title but a different drawing number 1252877-2A.

MR. SCHILLING: This is Spencer again. Maybe at that time that work in 1993 was a major conversion when the midbody was added. Any requirements for damage stability perhaps were evaluated at that time on that work and the down flooding points identified with that effort. There was an indication on the T&S booklet from that era that indicated that SOLAS damage stability chapter 2-B1 Reg. 25 was evaluated. And there might be some documentation on that with regard to down flooding points and things like that.

MR. VAN RYNBACH: This is Eugene. That may have been at ABS. Has ABS searched its records for that?

MR. STOLZENBERG: This is Eric Stolzenberg. We have a fair number of -- And we definitely appreciate hearing where to look for certain documents. We do have a fair number of documents from ABS. I can't say offhand whether we have it, but there's probably a good chance that we do.

MR. GRUBER: Being the interviewer here I don't know that it's -- Unless you're interviewing me, I don't know that it's an appropriate time for ABS to

be answering questions like that.

MR. STOLZENBERG: That's okay. We know the source document.

MR. GRUBER: Eric, I actually do have a question. We do have some documentation related to the 1993 conversion and there having been done a damage stability analysis for that.

MR. STOLZENBERG: Okay.

MR. GRUBER: But I have a related question to that. To your knowledge as a naval architecture firm, if you were modifying a vessel such as a load line increase to this situation, would you consider that a damage stability analysis should be done again considering the new load line as opposed to an old load line?

MR. SCHILLING: This is Spencer. That's something you consider and look at whether a damage stability assessment is necessary. In this case again we had the existing ship that we started with which apparently had a damage stability assessment done. So it was sailing with an approved damage stability evaluation and consideration. We weren't changing anything else in the cargo deck modifications that we did that would have affected that in terms of we didn't change the down flooding points or the hull buoyance

here or subdivision.

And then looking at the changes to load line and also permanent ballast installation, it was making it just like the other ships, the El Morro and the El Yunque. And it was our understanding that one of the down flooding points would have been sufficient for the El Faro or Northern Lights when it was converted in '93. And the load line and the permanent ballast installation made it identical to essentially the El Morro and the El Yunque in configuration and load line and everything else. And that one has apparently approved damage stability as well.

MR. VAN RYNBACH: At the new load line. This is Eugene.

MR. SCHILLING: At the new load line.

MR. STOLZENBERG: Okay.

MR. SCHILLING: And in fact the load line that was assigned for the El Faro mentioned that it was similar to the El Yunque and El Morro. So it didn't appear to us there was a need for validating the damage stability.

MR. STETTLER: Jeff Stettler again. Just to confirm, you believe that there was a statement made in an ABS document that allowed use of the sister vessel damage stability analysis to be used for the El Faro at

its new load line in 2006. Is that correct?

MR. SCHILLING: I can't recollect if there's a statement from ABS that says that the damage stability assessment can be applied.

MR. STETTLER: But that was your assumption that this was done.

MR. SCHILLING: Well, in terms of the load line, there was a reference that the load line was approved in part because it was the same load line that the El Yunque and El Morro were sailing with. And the ships were similar.

MR. STETTLER: Okay.

MR. VAN RYNBACH: Excuse me. This is Eugene. We have a document with the load line assignment from ABS mentioning that. Should we produce that document?

MR. STOLZENBERG: Is it a document we have also?

MR. STETTLER: I don't know if we do have it not.

MR. STOLZENBERG: Yeah, I think we can -- We'll continue.

MR. VAN RYNBACH: Okay. I have it right here.

MR. STETTLER: After lunch we can --

MR. STOLZENBERG: Thank you. Let's go off the record for a moment and get the document and we'll come right back on.

(Whereupon, a short recess was taken.)

MR. STOLZENBERG: We're back on the record at 12:09 p.m. with Herbert Engineering.

MR. STETTLER: This is Jeff Stettler. I've got a couple of questions as a follow-up regarding the load line assignment and potentially its connection to the damage stability analysis. We have observed a document which is an ABS letter.

MR. STOLZENBERG: Yes, dated 29 December 2005 to Herbert Engineering from ABS regarding Northern Lights ID 7500285 Sun Hull 6781966 Load lines preliminary freeboard assignment.

PARTICIPANT: Provided just now by Herbert.

MR. STOLZENBERG: Provided just now by Mr. Eugene van Rynbach here at Herbert.

MR. STETTLER: So the question -- And we're also looking at the 2006 load line certificate dated -- I'm looking for a date on this --

PARTICIPANT: The fourth page.

MR. STETTLER: Fourth page.

PARTICIPANT: No, second page. Sorry.

MR. STETTLER: There we go. Yes. Oh, valid

until. So completion date, 27 February 2000 --

PARTICIPANT: No, issue date is 29 January 2011.

MR. STETTLER: Oh, issue date is 29 January 2011 by Robert Neil Powell from Mobile ABS Surveyor. So the question is that the referenced letter from 2005 which talks about a preliminary freeboard assignment of a Type B load line is based on a sister vessel, the El Morro, Hull 666 and that it assigns the preliminary load or preboard -- excuse me -- of 12 feet 5/16ths of an inch which corresponds to a load line extreme draft of 30 feet, 2-3/8ths inches which is the current and also referenced on the load line certificate we just mentioned.

So the question for Herbert Engineering just in your opinion or based on your experience is would you expect that a damage stability analysis would have been done to support the load line assignment, any load line assignment but a change in load line, for the El Faro or the Northern Lights at the time which effectively increased the load line by two feet? Would you have expected a damage stability analysis to support that?

MR. SCHILLING: This is Spencer. I think our -- I'm trying to recollect what our thought was at

the time. The changes that are being made to the vessel were being made to make them similar in arrangement to the sister ships. So just like there's occasions when you can apply light ship weight and CGs from a sister vessel to another vessel in that class, it appears to us that the damage stability assessment that would have justified or that might have been done for the increased load line or the permanent ballast was in place with the sister vessels. Therefore, it would apply. We're going for the same load line and same permanent ballast installation for the El Faro. So there wouldn't necessarily need to be a new validation of that assessment.

MR. STETTLER: So to your knowledge then -- Jeff Stettler again -- there would have been for you to reach that conclusion a damage stability analysis on a sister vessel at the same load line. Is that correct?

MR. SCHILLING: Yes. In the T&S booklet for the El Yunque and El Morro, there's a statement in INTACT stability required GM page that says the INTACT required GMs -- I'm paraphrasing -- on this page are more conservative than the dynamic and damage stability requirements.

So taking that information it appears that a damage stability assessment was done. We weren't

involved in that. We weren't involved in the T&S book at the time. It was a different owner. With that evidence, something had been done as well. And again we were just applying the same load line.

MR. STETTLER: Okay. This is Jeff Stettler. So just for the record, Mr. Stolzenberg, I think that means that we need to request documentation on the El Morro or the El Yunque to verify that that damage stability analysis supports that load line assignment for those vessels which were then utilized.

MR. SCHILLING: This is Spencer. But again as part of load line, there was no damage stability requirement.

MR. STETTLER: Right. I guess I should restate that. Not necessarily for the draft of 30 feet 2-3/8ths inches. I think there would be a damage stability analysis which would demonstrate that the limiting GM criteria is in fact the weather criteria and not the damage criteria. Is that correct?

MR. VAN RYNBACH: This is Eugene. Under load line regulations, I don't believe it's a requirement. The load line regulations if you're a type B freeboard you're not required to do a damage stability analysis. It's under other requirements.

MR. STETTLER: Right. But again I get back

-- Jeff Stettler again -- to limiting the required GM curve which Mr. Schilling just mentioned has a statement stating that the limiting GM criteria is the weather criteria and therefore not the damage condition criteria. In order to verify that that's indeed the case, I would think that a damage stability assessment would have been required to reach that conclusion.

MR. SCHILLING: Required or performed.

MR. STETTLER: Performed, right. Exactly.

MR. SCHILLING: But not as a requirement of the load line.

MR. STETTLER: Correct, yes.

MR. SCHILLING: So it wasn't related to the load line.

MR. STETTLER: Directly. But at that draft of the load line which the vessel would operate.

MR. SCHILLING: Right. So if you're going to say that in T&S booklet that the damage stability criteria is less severe than the INTACT wind (Inaudible) criteria.

MR. STETTLER: Right.

MR. SCHILLING: You would assume it had been checked at the draft or whatever damage stability requirement required the draft to be checked at.

MR. STETTLER: Okay. Thank you.

MR. STOLZENBERG: This is Eric Stolzenberg. Before we continue on this topic, what I'm going to call Exhibit A which is what Mr. van Rynbach brought into the room after the break is an ABS Americas telefax with a preliminary freeboard assignment dated 29 December 2005 for the Northern Lights ID 7500285. And we'll call that Exhibit A.

(Whereupon, the above-referred to document was marked as Exhibit A for identification.)

PARTICIPANT: And just actually write Exhibit A on it and put your initials.

MR. STOLZENBERG: Understood.

PARTICIPANT: We will make photocopies.

MR. STETTLER: Just for process you're doing that because we don't already have the document.

MR. STOLZENBERG: That's correct. It's been introduced.

PARTICIPANT: You don't know whether you have it.

MR. STOLZENBERG: This is Eric Stolzenberg. It's been introduced here today in case we do not have it.

MR. STETTLER: So this one we don't have to --

PARTICIPANT: We actually have that document as well.

PARTICIPANT: We have it.

PARTICIPANT: Yes.

PARTICIPANT: Now you've got more.

MR. STOLZENBERG: And we can continue on with the discussion and additional questions.

MR. GRUBER: Tom Gruber. You said that the indication on the GM curve from the El Yunque and the El Morro T&S booklet indicated that it met a damage stability requirement.

MR. SCHILLING: Yes. That's the way I took that statement to read. It didn't say what damage stability requirement was meeting. It just said that -- I'm paraphrasing from recollection again -- the damage stability required GM was less than the wind heel INTACT stability criteria that's in the T&S booklet. The implication is that if you meet that INTACT requirement you would also meet the damage stability requirement.

MR. GRUBER: Did you verify what damage requirement that the El Yunque and the El Morro would have met?

MR. SCHILLING: No, I did not.

MR. GRUBER: Okay. So you don't know for

sure if that was the same damage requirement that the El Faro was required to meet.

MR. SCHILLING: I do not.

MR. GRUBER: Okay. Do you have a copy of the El Yunque and El Morro T&S booklet in your files?

MR. SCHILLING: Yes. We have one from 2001 which I believe is the current one.

MR. GRUBER: Is it permissible to ask to have that brought in since that's what the questioning referred to?

MR. STOLZENBERG: Absolutely. If we would like to go off the record and --

MR. SCHILLING: I don't know if I have it here. MR. VAN RYNBACH: We have it.

MR. SCHILLING: Oh, do you? Okay.

MR. GRUBER: If we could.

MR. STOLZENBERG: So for a moment we'll go back off the record and obtain an additional T&S booklet and return. Off the record.

(Whereupon, a short recess was taken.)

MR. STOLZENBERG: Back on the record at 12:23 p.m. at Herbert Engineering. Mr. van Rynbach has brought in a trim and stability booklet for the SS El Yunque stamped by ABS 2 February 2001. We're going to call that Exhibit B.

(Whereupon, the above-referred to document was marked as Exhibit B for identification.)

And Tom Gruber will continue.

MR. GRUBER: Okay. On page 12 is the wind heel required metacentric height and towards the bottom of the page it states, "These requirements exceed dynamic stability and damage stability requirements." There's no reference in the booklet what damage stability requirements or criteria that this refers to. Is that a fair statement?

MR. SCHILLING: That's our understanding, yes.

MR. STOLZENBERG: And I'll invite to go around again regarding load line/damage stability assessments, previous vessels, along this topic.

Mike, do you have anything on the phone?

(No verbal response)

Mike?

MR. KUCHARSKI: Hello.

PARTICIPANT: He was on mute.

MR. STOLZENBERG: Mike, this is Eric Stolzenberg. Do you have any questions regarding load line and damage stability assessments on the topic we've been discussing?

MR. KUCHARSKI: Not on the direct topic, no. I do have questions about the T&S book.

MR. STOLZENBERG: Dennis? Tom?

MR. GRUBER: No.

MR. STOLZENBERG: Jeff?

MR. STETTLER: No additional questions.

MR. STOLZENBERG: Okay. Then, Mike, why don't we move onto your questions on the T&S book?

MR. KUCHARSKI: Okay. Just a quick one on the T&S book, the instructions in there. Was anything updated on that for the containers, the addition of the weights up high?

MR. STOLZENBERG: And to be clear, Mike, what you're discussing is the El Faro T&S booklet.

MR. KUCHARSKI: Yes.

MR. STOLZENBERG: The latest version.

MR. VAN RYNBACH: We've got a copy.

MR. SCHILLING: We have it right here.

MR. STOLZENBERG: Let us break out our copy. So we're looking at February 14, 2007 entitled Final T&S Booklet for the SS El Faro, ABS approved stamped version on May 31, 2007.

MR. SCHILLING: This is Spencer. So the revisions to the T&S booklet were done at the time of the modifications to the deck cargo. We were to add

the stowage locations and arrangement of the container cargo and provide a means and provide reference information for weight and CG tabulation to allow that to be added to the loading case assessment.

Where there were detailed container forms added in the manual to summarize and accumulate data, container weights and centers of gravity and then the summary forms modified to include locations for that to be entered in the T&S calcs.

MR. KUCHARSKI: Okay. But nothing as far as instructions or changes. I mean we have changes from a row-row to a row-load with higher windage with the stacks on there. Any instructions that I missed in there for that change?

MR. SCHILLING: Well, there were no specific changes to instructions for the movement from row-row cargo to container cargo required in the T&S booklet in terms of instructions of how to stow things. The weight accumulation and the weight summary for trim and stability calcs would be the same. You just have to -- You can use the new forms for the containers.

What did also change instead of the instructions were the required wind heel GM curves. So those were updated for the wind profile for the container stacks. If we look at page 16 of the T&S

booklet, previously referenced, those minimum required wind heel GM curves have been updated for the container profile.

MR. KUCHARSKI: Okay. Thank you. I guess I'm sort of looking at it from a simplistic ex-master's view. Is there anything in there that talks about the actual wind or voidance or anything like that in the booklet that I missed?

MR. STOLZENBERG: This is Eric Stolzenberg. Mike, are you asking specifically for some type of guidance for the master to get from the book regarding wind?

MR. KUCHARSKI: Yes, the instructions. I mean there are instructions in there talking about reducing (Inaudible) to help stability. The question I guess about winds, is there anything in there to the user as you gents probably know with the mates on there and the master to look at the booklet? Is there anything that I'm missing in there that talks about the actual wind heel that jumps out and hits them?

MR. FRANCE: What the standards are?

MR. KUCHARSKI: Okay.

MR. FRANCE: Is that what you mean? This is Willa France, Mike.

MR. KUCHARSKI: Yes, what the standards are

or everything it's based on, 26 feet per second or 50 something knots of wind or anything like that?

MR. SCHILLING: This is Spencer. I don't believe there's anything in this booklet that was there as either row-row or now with the container profile that would indicate the actual wind force that was assumed for the calculations. These wind heel calculations were done the same for both row-row and container cargo. They use the same Coast Guard applied wind heel requirement. So that hasn't changed.

And there was no reference to the actual assumed wind force or other things from the regulation. Usually it's just the indication of the required GM curves.

MR. VAN RYNBACH: This is Eugene. I don't think the wind heel is intended -- the Coast Guard wind heel requirement tended to be a maximum wind. It's a standardized wind which causes a heeling moment on the ship and the ship must be able to withstand that according to certain criteria, how much heel it causes and so forth. But it's not an upper limit to what the ship operating condition is. It's just the standard wind force which is used to evaluate the stability of the ship.

MR. KUCHARSKI: Right. Sorry, guys. I've

been through stability reviews on passenger ships and seen numbers of 90 knots or I've seen numbers of (Inaudible) or whatever and instructions. I guess I may not be able to make the jump over to cargo and see anything similar like that. Okay. Thank you very much.

MR. STOLZENBERG: I'll push around for questions on the T&S booklet. That's the topic area at the moment.

PARTICIPANT: No.

MR. STOLZENBERG: Tom.

MR. GRUBER: I don't believe so.

MR. STOLZENBERG: This is Eric Stolzenberg, NTSB. One of my questions is on board the vessel there was CargoMax we know from the interviews and there's a T&S booklet. And I know -- I believe I know -- CargoMax and T&S booklet are both approved by class. And we know the CargoMax insulation is tested and recertified through validation testing.

What I'm curious of is the relationship between CargoMax and T&S booklet as far as their usage aboard the vessel. The ABS review letter indicates and I'll quote it "The approved stability software is not a supplement to the approved T&S booklet." What's the practical difference that that statement exists for in

your mind as Herbert Engineering?

MR. SCHILLING: Could you read that statement again?

MR. STOLZENBERG: "The approved stability software is not substitute for the approved stability information and is used as a supplement to the approved T&S booklet." And I'm asking that from an operator's standpoint.

With the NTSB we go and see what people practically use on board the ship. Well, there's a CargoMax for on board there and a T&S booklet. And interviews of the crew seem to indicate they gravitate towards the CargoMax software. So why is there a separation that CargoMax is not to be used in T&S booklet as the more reliable document for lack of a better term?

MR. SCHILLING: The preferred document.

MR. STOLZENBERG: The preferred document from a Class standpoint. And I guess what I'm asking is is there engineering behind that. Is there more accurate calculation behind it? Why is it that the T&S booklet is the final master document?

MR. SCHILLING: This is Spencer. I can't speak for Class in the sense of why they do that. But I do know that statement generally indicates that the

T&S booklet is the ultimate authority on stability for the ship. And the point of the approvals for the CargoMax program is to make sure it's matching that and so the crew has comfort in using that to replicate what the T&S booklet is going to give them if they were to redo the calculations that were in the T&S booklet.

And in the T&S booklet they would match results from the CargoMax program. But the ultimate authority is the T&S booklet. We believe that's what that statement indicates.

MR. STOLZENBERG: No, it is.

MR. SCHILLING: And so there are efforts made to make sure that if there are things that affect some of the calculations the way centers of gravity for tanks for instance are calculated in the CargoMax that that information is provided in the T&S booklet that can be reviewed and approved. So then some of those calculations can be done in the T&S booklet and the program isn't doing much more than the trim and stability booklet can do.

That's changed a little bit for some ship types in more recent years where the calculations can be done in the loading that cannot be possibly done in the trim and stability booklet with a hand calc form like damage stability for tankers and things like that

where there is a direct calculation required instead of requiring GM curves. But I think in this era the idea was that the CargoMax program loading instrument replicated what the T&S booklet was doing.

MR. STOLZENBERG: Okay. Thank you.

MR. STETTLER: Can I ask a related question to that? And I don't know. Maybe we need to pull up CargoMax later, but the user selects the GM, the limiting required GM, criteria in CargoMax. And you can either select the trim and stability book basically by tier or you can select the option which is an auto wind heel calculation option.

MR. SCHILLING: Right.

MR. STETTLER: And my recollection from reading the CargoMax users manual and the El Faro -- and I forgot the exact title -- specific users manual. There's a document related to its application, specifically the El Faro.

MR. SCHILLING: Vessel Information Booklet.

MR. STETTLER: Yes. Thank you. Vessel Information Booklet. It talks specifically about -- And I should add. There is also a document which is a wind heel calculation manual.

MR. SCHILLING: Right.

MR. STETTLER: That goes along with that

that goes through all that and validates and compares. As I recall, there is a statement in that wind heel book as well as the El Faro book that states that the auto wind heel option is more accurate and less conservative. So rather using -- If you're three high, using three high all across, it will calculate the specific windage area in the calculation. And therefore it is less conservative or more precise is another way to do that.

To me that idea seems a little bit in conflict with the statement that Mr. Stolzenberg just read which states or tells the master that he must or should follow the guidance in the trim and stability book and not the loading instrument, CargoMax in this case. It seems that it puts the master at a bit of a conflict there. Could you comment on that?

MR. SCHILLING: Right. This is Spencer. The INTACT required GM curves that are in the T&S booklet, I think there are four or five different curves. And each one reflects a different assumed profile of the containers on deck, the height of which the containers are stacked on deck. And with that you can only assume certain even profiles, one tier high everywhere, two tiers high, three tiers. There are some rows that allow four and five high. So an effort

is made to use those curves to define a generic profile for the ship.

When the ship is actually loaded, the profiles can vary. They can be different. And so the general guidance in the T&S booklet is that you should go with the curve that -- how do I describe this -- describes the maximum boundary of the actual containers stowed on deck. So if you're three tiers but you've got one tier that's four high, you have to go to the next curve up.

Even though you don't quite meet the definition of the next curve, you would use that. And it's done that way so that you have just a reasonable number of curves to work with in the T&S booklet. And the basic CargoMax program and the curves that you can select are those exact same curves.

But there is a feature in CargoMax and I believe it was implemented for the El Faro that because they enter the detailed container stack profile and container locations in the program the program can calculate the actual height of each stack of containers on the ship. So it knows the actual profile.

It doesn't have to make an assumption about I have to go to the next curve up. So it's got the information to do the actual calculation of a new

required GM curve at that particular profile. That's what's implemented in CargoMax as an option.

Because that differs a little bit from what's allowed in those predetermined curves in the T&S booklet, that separate document which compares these curves in the T&S booklet and CargoMax with the direct calculation of the wind heel required GM is produced and submitted with the CargoMax program to get reviewed and approved and get someone to say "Yes. We agree with this approach that this wind heel calculation can be done this way. And we see that the answers are consistent with the T&S booklet documentation."

MR. O'MEARA: So that was approved by ABS.

MR. STETTLER: Right. This is Jeff Stettler. And I guess the reason I bring it up is because the approval letter -- I can pull up an example here of CargoMax, the approval letter for CargoMax. Here is the approval letter example. It has a statement in there as well.

MR. STOLZENBERG: And this is Eric Stolzenberg. For the record, we're looking on screen at the Reference 314297 dated 8 February 2008 from ABS Americas, the approval letter for CargoMax.

MR. STETTLER: So I just wanted to clarify or state this. To me, it seems like there's just a bit

of a conflict here between the trim and stability book which is more conservative I think in this regard on the required GM in terms of the master, what the master would have to do, versus what the CargoMax program will calculate. So the operator using CargoMax alone would have a less restrictive operating condition than he might get otherwise using the trim and stability book.

MR. FRANCE: Could you look down further? Isn't there something in that letter about the wind heel criteria?

MR. STETTLER: I don't believe there is.

MR. SCHILLING: This is Spencer. I think --

(Off record comments)

MR. VAN RYNBACH: This is Eugene. I'm not sure that the trim and stability booklet precludes you interpellating between the curves, does it? I don't think it specifies that you -- Essentially what this program does is interpellates between the curves.

MR. STETTLER: Right.

MR. VAN RYNBACH: So I don't think the stability booklet precludes you from interpellating.

MR. STETTLER: The same calculation.

MR. VAN RYNBACH: Yes.

MR. STETTLER: Right.

MR. VAN RYNBACH: So if you have one

container over, I think you may be allowed to interpellate. Some books do allow that.

MR. STETTLER: The reason I bring this up is there are some people who are saying that you have to follow the trim and stability book. But yet CargoMax -- and I don't know that there's a statement. I thought there was a statement in this letter saying essentially that the trim and stability book needs to be followed. This is simply a supplement.

MR. VAN RYNBACH: Yeah.

MR. STETTLER: Which I think, Spencer, you had mentioned.

MR. VAN RYNBACH: No, I think the question is -- Eugene again -- whether or not you can interpellate.

MR. STETTLER: Right.

MR. VAN RYNBACH: This is what the CargoMax program does, interpellate between curves. So it may not contradict the trim and stability booklet if you consider the CargoMax an interpellation.

MR. STETTLER: So paragraph five "Please be advised that as per references A to B approved stability software is not a substitute for the approved stability information and is used as a supplement to the approved trim and stability book references and

facilitates stability calculations."

MR. VAN RYNBACH: So that's where it does tie to that automatic wind heel calculation.

MR. STETTLER: Right.

MR. VAN RYNBACH: That is reference C.

MR. STETTLER: Okay.

MR. VAN RYNBACH: So it allows it to be done a little bit more accurately because it has an automatic interpellation between the curves.

MR. SCHILLING: This is Spencer. And in the sense it's meeting the same stability criteria.

MR. STETTLER: Right. I would just like to get that on the record here because there's some swirling discussion about this of whether or not the master can even use this if the trim and stability says one thing. And I think your point about it's interpellating it's actually doing the calculation is an important point. Thank you.

MR. STOLZENBERG: And this is Eric Stolzenberg again. And thank you for your opinion on it. Of course, we'll get ABS opinion when we do an interview as well.

MR. SCHILLING: Yes.

MR. STOLZENBERG: That your interpretation of is valid. I guess part of my interest is and what

I've become aware of in this accident is that the software programs for stability, the real time capability of them, is improving rapidly. And the T&S booklet and the software program it's interesting that they both exist at the same time. And what happens in the future is of course another matter. But it's just quite interesting.

MR. VAN RYNBACH: A little background on this -- this is Eugene -- some of this is historical reasons. Historically, the stability booklet was a manual calculation. And then computers came in the '80s. But computers weren't considered reliable. So the old paper booklet was still considered primary because a computer was suspect.

So some of that terminology is left over from those days. That letter is in the stability -- Approvals tend to be based on -- Some of that is from those historical reasons. But as Spencer mentioned, you also have to have one source as primary. This is the governing source.

MR. STOLZENBERG: Thank you. We'll just go off the record for a moment because of the lunch plans had been discussed. And we'll come back. Off the record.

(Whereupon, a short recess was taken. Tape 1

ends.)

MR. STOLZENBERG: This is Eric Stolzenberg. It's January 28th at Herbert Engineering, Annapolis. We returned and we're going back on the record to continue the interview of Mr. Eugene van Rynbach and Mr. Spencer Schilling.

Gentlemen, I just want to ask some basic questions about stability, intact and damaged. I'll start with this question. What stability criterion did the El Faro have to meet regarding intact and damaged?

MR. SCHILLING: This is Spencer. The intact stability requirement was the U.S. Coast Guard wind heel requirement.

MR. STOLZENBERG: Okay. And the damage requirement?

MR. SCHILLING: The damage requirement I believe that was in place for the El Faro was the probabilistic damage stability requirement. SOLAS essentially.

MR. STOLZENBERG: SOLAS. Let me go back to intact. When you said it met wind heel requirement, I understand or I recall there being writing arm requirements in intact. Can you explain the difference to me or why one is limiting and why another isn't? Or are they both not applicable to this vessel?

MR. SCHILLING: I believe the only applicable intact stability requirement was the U.S. Coast Guard wind heel requirement and not the writing arm or other weather criteria.

MR. STOLZENBERG: In layman's terms, what is the wind heel requirement? What margin of safety does it provide to a vessel? Or how is it -- If you don't understand, that's fine. Please let me know. I'm just trying to understand what it's trying to protect the vessel from or what --

MR. SCHILLING: The basic wind heel requirement develops a required GM that a ship has to sail with intact based on the wind profile of the ship, the heeling moment that that creates under an assumed wind velocity. And the GM is established as a requirement to limit the heel that you end up with under that wind force. So it only checks the quasi-dynamics or the wind heeling angle that's imposed by a wind force based on the wind profile.

MR. STOLZENBERG: Okay.

MR. SCHILLING: And there are other intact stability criteria for different types of ships and other ship categories and other regulations that deal with writing energy as well. So it might be requirements for GZ area limits, maximum GZ values

that's the writing arm, the range of positive GZ, things like that.

MR. STOLZENBERG: All right. I'll push it around the table regarding intact stability.

MR. O'MEARA: This is Dennis. So given what you just said about the wind heel requirement, are there other factors that it takes into account? For instances, if you're talking about a 45 knot wind or a 50 knot wind, does the wind heel limit also presume the kind of seas that would be generated by that kind of wind? Or does it presume that there's no ocean activity and you're just talking about how much wind is driving against the side of the ship to heel it over?

MR. SCHILLING: This is Spencer. I wasn't there when it was derived. And it doesn't explicitly say what type of sea states are applicable. The criteria itself does not include a definition of the sea state. It's not factored into the calculation.

But the criteria applies for ship in general at sea in an unrestricted service. So it's not a criteria that's only applied for ships when they're in calm water.

MR. GRUBER: Tom Gruber. Does the position of the down flooding point have any effect on the intact criteria that's applicable?

MR. SCHILLING: The intact wind heel requirement includes the angle of heel as a function of the freeboard to the margin line which is a deck edge. And that happens before you would possibly ever get to a down flooding point which would always be above a deck edge. So it does not.

MR. GRUBER: Thank you.

MR. STETTLER: Nothing specific on intact.

MR. STOLZENBERG: Mike on the phone?

MR. KUCHARSKI: Nope. Nothing from me.

MR. STOLZENBERG: Okay. Earlier I believe it was said and as I understand it from some of the documentation, the vessel is an intact stability weather criteria limited, not damaged stability limited. Is this typical is I guess what I'm asking. I think I've read a few articles and having recently gone to the IMO where they discussed second generation intact stability, that it's atypical to have a vessel that is weather criteria limited versus damage stability limited. Is that typical in your experience for cargo ships like this?

MR. SCHILLING: This is Spencer. I think it depends a lot on what type of ship you're looking at. Certainly when you do the probabilistic analysis you do the analysis at some specified GMs.

And it's possible that you select those GMs at which you run the damage stability to be the ones that correspond to the intact requirement. So if you meet the intact requirement at those GMs, you also meet the probabilistic damage stability requirement. One is not more governing than the other. As a matter of fact, you could say at that point that maybe the intact requirement is the more severe and that certainly is the case for some ships.

So to say that it's unusual that the damage requirement doesn't govern I don't know. That's a matter of judgment.

MR. VAN RYNBACH: This is Eugene. Also there is a IMO intact stability code weather criteria which is different than the Coast Guard wind heel criteria. And compared to the -- At least, my experience in the past was compared to the IOM intact stability requirements, the Coast Guard wind heel may be higher.

So maybe what you saw at the IOM is discussing the IOM intact stability requirements which may be less than the Coast Guard wind heel requirements. I know many ships in the U.S. Flag switched from Coast Guard to IOM because it was favorable to the ship. The Coast Guard wind heel is

not used so much for modern, you know, ships in the last ten years. It's more for older ships.

MR. STOLZENBERG: That's interesting. Thank you. I'll kick that one around the table.

(Chorus of no's.)

Mike on the phone?

MR. KUCHARSKI: No thank you.

MR. STOLZENBERG: Okay. We'll move on deterministic versus probabilistic damage stability. What is the difference between deterministic and probabilistic stability?

MR. SCHILLING: This is Spencer. In a deterministic damage stability assessment, the regulations specify damage cases that have to be assessed and gives you a survival criteria for those damage cases. So it will give you extensive damage.

And you have to consider every possible combination of compartments that could be damaged within those damage extent and evaluate the survival characteristics for each of those. And for each of those, the vessel has to survive the damage.

For probabilistic, what they do is they apply statistics to the damage extent essentially. And so the smaller damage extent have a higher probability of occurrence that the larger damage extent have a

smaller probability of occurrence. And you create a series of damage cases with those varying extent and you apply probabilities to their occurrence.

And then you assess the survival in each one of those. And you accumulate the survival probability based on the combination of the statistics for the damage extent and the survival of each one of those cases. And that survival probability has to attain a certain index based on the ship size configuration.

MR. STOLZENBERG: In the case of the El Faro as we understand it, it's probabilistic damage stability done in 1993 time period. How is the information from the probabilistic analysis given to the master or the crew on the vessel? How would they use -- I guess what I'm getting at is a deterministic the master would know if he has two compartments flooded. He knows his vessel's okay if it can withstand two compartments flooded.

In probabilistic, how does he know that the damage he's sustained matches a case that's been considered by the naval architecture firm that does the probabilistic assessment?

MR. SCHILLING: This is Spencer. So even with deterministic, it's not as simple as say if I can survive two compartment damage in all cases because

there's still an intact GM associated with that survival and maybe some tank loading restrictions.

The way it's communicated in the T&S booklet is it would be communicated through the T&S booklet to the master. And in the T&S booklet would be some statement about in order to survive damage stability you have to meet these required GM curves at these drafts and I'm thinking deterministic basis now, deterministic rule. And also at these drafts you have to have so much weight or so much of the tank filled because the level of fill in the tank will affect the damage survivability capability.

It can be if the ship is simple, maybe you don't need loading restrictions and you just have required GM curves. But if the ship is complex, then you might have to have loading restrictions, GM curves at various drafts. And that would have to be checked at every intact departure.

I'm at this intact departure. I only have these tanks filled to this level. I've got to go into my damage stability requirement list and see if I'm at this draft and with these tanks. What required GM do I have and do I meet that at departure and throughout the voyage?

Then they would know that they satisfied the

damage stability requirements. That would be the method of checking.

With probabilistic approach, the calculations are done at two or three predefined drafts. And you evaluate it for specific GMs. So typically you'll do that evaluation at some GMs, run the calculation. If you attain the index, then those GMs become your guidance on what your intact case has to be. And you cannot go below those GMs. So any GM above that works and any GM below that doesn't work.

And you can generate a curve from those two or three values. But it's very unusual to have any kind of loading ships to do that. But it's communicated through the GM, essentially intact GM.

MR. STOLZENBERG: And probabilistic.

MR. SCHILLING: In both really.

MR. STOLZENBERG: Both.

MR. SCHILLING: So rather than just saying you're a two compartment ship or one because that's GM related -- the probability is it's GM related -- that's not going to be enough to tell you if you're good or not.

MR. STOLZENBERG: Understood. I'll go around the table.

MR. GRUBER: So you're saying for the

deterministic if you meet the GM curve and the loading restrictions, the ship will survive the damage to the extent defined in the regulation.

MR. SCHILLING: This is Spencer. That's correct.

MR. GRUBER: Okay. Now for probabilistic, does the same hold true? Will it survive all the possible cases of damage and still meet the criteria? Does meeting the criteria mean all cases of damage will comply?

MR. SCHILLING: This is Spencer. No, it's not the case. So there are certain damage. They could be two compartment, three compartment, four compartment that will not survive. No survive meaning they don't meet the survival criteria. It doesn't necessarily sink, but it doesn't meet the GZ area requirements or the (Inaudible) requirements, things like that. That particular damage case can fail the criteria, but you're adding up small components of survival from all the different damage cases.

And you have to get to a certain attained index. So it's the preponderance of damage cases have to survive enough to add up to an achieved index that equals the required index.

MR. GRUBER: Tom Gruber again. But there

are cases that will fail to meet the criteria or the vessel could possibly sink in those conditions. Yet the vessel will still overall comply with the criteria.

MR. SCHILLING: This is Spencer. That's correct.

MR. GRUBER: Thank you.

MR. STOLZENBERG: This is Eric Stolzenberg to follow up. But what probabilistic is attempting to do is make those low probability events that would result in a vessel sinking, but nonetheless still allow it to pass probabilistic damage to regulations?

MR. SCHILLING: This is Spencer. Yes. I think the golden rule was to try to achieve a consistent safety level for the ship. When you define fixed deterministic case and fixed extent -- so you have a two compartment ship -- the probability of damage of just two compartments or maybe over to that third compartment is not much different. And yet you may not survive three, but you survive two.

Just by adjusting your bulkheads you can survive the deterministic, but you may have an increase in safety level too much. You can achieve varying levels of safety margin in that case.

So I think the probabilistic rules were a way to try to achieve more consistent safety level as

ship designs change and different ship types were developed.

MR. STOLZENBERG: Before I pass it on to Jeff, I mean this is an opinion question over the course of your career. Do you think they have achieved safer levels of damage stability?

MR. SCHILLING: Well, I think certainly in a sense that we had started down the road of probabilistic in the late '70s simply because there were no dry cargo ship damage stability regulations at all. There was nothing in place. The passenger ships had some, but there was nothing for -- And tankers went through MARPOL (phonetic).

But dry cargo ships had no requirements whatsoever. And that was the case when these ships were initially built. There were no damage stability regulations at all.

And then when they started developing the damage stability regs for cargo ships and they started taking them to IMO and doing those kinds of things probabilistic seemed like the best way to go to achieve that. They had the model of the passenger ship rules already. And so they tried to apply the same theory and technology and approach to cargo ship damage stability.

MR. STOLZENBERG: Okay. So in fact before probabilistic applied to this vessel, it would have no damage stability requirements to your knowledge.

MR. SCHILLING: I don't think there were any damage stability.

MR. STOLZENBERG: Okay.

MR. GRUBER: Different subject or do you want to stay on this subject?

MR. STOLZENBERG: I'd ask Mike on the phone if he has anything along the lines of conveying damage stability to master.

MR. KUCHARSKI: No. No thank you.

MR. STOLZENBERG: I'll let you take the next subject, Jeff.

MR. STETTLER: Okay. Change gears a little bit. I just wanted to ask a couple of questions about your development of some of those reference documents. And we'll start with the cargo securing manual rev zero which dated December 2005 which I believe is the last one submitted. So I guess the one document.

What did you use as the basis for that document? Did you develop that from scratch for the El Faro?

MR. SCHILLING: Those documents -- this is Spencer -- the cargo securing manuals for the El Faro

was based on the documents formatted for the El Yunque and the El Morro which were products of Manson Navigation. It was their standard cargo securing manual format. And it's the one they still use.

MR. STETTLER: Okay. So you use those as your basis. What other relevant references for cargo securing manuals in general? Are there guiding requirements for those coming from the Cargo Bureau? What determines what's going to be included in a cargo securing manual? And what kind of calculations get done for example?

MR. SCHILLING: There are IMO guidelines for container securing and cargo securing.

MR. STETTLER: Okay.

MR. SCHILLING: There are also class rules and/or guidelines for container stowage, cargo stowage and container securing.

ABS has guidelines for container securing. I don't believe they're required to be used. In other words, those would define the lashing limits and the stack weights and things like that for containers and container securing system.

ABS doesn't require that you use their lashing guidelines in formulations. Matson had -- We shouldn't talk Matson, but SeaStar and TOTE I believe

were using the ABS guidelines for things like container securing.

MR. STETTLER: Okay. Very good. Thank you.

MR. VAN RYNBACH: This is Eugene. Just to clarify, there is an IMO document describing what should be in a cargo securing manual and that also lays out a sample format for a cargo securing manual for the different sections. So most cargo securing manuals are constructed according to that IMO document.

MR. STETTLER: This is Jeff Stettler. Do you happen to know the name of that?

MR. VAN RYNBACH: It's most likely listed in the cargo securing manual as a reference.

MR. STETTLER: Okay. I think you're right. I took a glance through it, but I didn't read it in detail. Thank you.

Can we go onto some other documents or do you want to talk specifically about the cargo securing manual?

MR. STOLZENBERG: I'd just ask if anyone else has anything on the cargo securing manual.

(No verbal response)

Mike on the phone, cargo securing manual?

MR. KUCHARSKI: Yes, I have a few on the cargo securing manual. Thank you.

Do we have a copy of it out there or no?

PARTICIPANT: I can pull it up on our computer here, Mike, if you want to refer to something.

MR. VAN RYNBACH: This is Eugene. We do not have a printed copy here. It's like 160 pages.

MR. KUCHARSKI: Yeah. Whatever you want to do. I have specific questions on the cargo securing manual.

MR. VAN RYNBACH: Okay. There's an electronic copy now available on a video screen.

PARTICIPANT: We brought it up, Mike. We have the SeaStar Line SS El Faro cargo securing manual approved by ABS 20 January 2006.

MR. KUCHARSKI: Perfect. Specifically on page 18 -- First of all, if I look through the manual I don't see anything that talks about testing of any of the securing systems as you call them or securing equipment. On page 18, there's a table which talks about tests. So what tests were envisioned under that table?

MR. SCHILLING: Is there a procedure number in the upper right-hand corner of the page?

MR. KUCHARSKI: Let me see. It's page 18.

PARTICIPANT: Oh, it's sheet number 18 in

the PDF.

MR. KUCHARSKI: Yeah, in the PDF.

MR. SCHILLING: Okay. I'm sorry. You're right. We're right there then.

MR. KUCHARSKI: It's numbered E03435, page six of six. It has test result on there. So what tests do they envision?

MR. SCHILLING: This is for inspection of the actual portable securing devices like twist locks, turn buckles, lashing rods. It's a matter of looking at them to see if they're operating correctly. There are some instructions in there I believe about how to operate a twist lock and whether the mechanism is working or the turn buckle. And it's just a visual inspection or test that that operates correctly.

MR. FRANCE: To be completed by whom?

MR. SCHILLING: By the ship's crew. For the actual securing equipment like the same portable lashing gear, they're supplied with strength test certificates provided by the manufacturer. So the safe working load, the mean braking (Phonetic) are indicated on certificates, reporting on tests done in the class rules certifying the strength of the equipment.

MR. KUCHARSKI: So that certification was when it was as-built or when it was installed, correct?

MR. SCHILLING: Well, whenever they purchase new container securing equipment they should be getting the certificates with it. And those certificates should either be filed in their system with Class or appended to the manual.

MR. KUCHARSKI: I guess I'm confused because you keep going to container securing. But if you go the page right before it talks about inspection requirements for structure, fixed securing devices. Are the buttons and D-rings not considered fixed securing devices?

MR. SCHILLING: The buttons on the deck for the rollout boxes and the D-rings and things those are fixed securing devices. They don't go through factory strength tests. So this checking and logging here is for again a visual inspection of those on board.

MR. KUCHARSKI: Okay. So when you say test result, I guess I look for some kind of a pull test, some kind of strain gauge, something on it there besides a subjective test. So more objective. The test results you're really talking about a visual inspection.

MR. SCHILLING: Yes, and if the mechanism is working. In the case of a rollout box, it might be if they see some damage or some anomaly in the button that

they place the rollout box in and see if it can be secured and the locking mechanism works.

MR. KUCHARSKI: Okay.

MR. SCHILLING: It's not a pull test for a strength requirement.

MR. KUCHARSKI: On page 27 of the manual, you call this a container ship. And you say -- I hate to paraphrase it -- it predominantly carries containers. Can you tell then is everything else nonstandard cargo under the CSS? What's standard cargo for the ship?

MR. SCHILLING: Well, standard cargo for the ship would be both containers and the row-row trailer cargo, the normal trailer cargo that they have.

MR. KUCHARSKI: It would include -- I'm sorry -- the trailer row-row cargo. Is that correct?

MR. SCHILLING: That's part of their standard cargo. That's correct. The trailer cargo that they have with the roll lock buttons that they load with the yard tractors.

MR. KUCHARSKI: Okay. So on page 28 where it talks about Annex four (phonetic) special wheel-based rolling cargo, those wouldn't be included in that trailers.

MR. SCHILLING: I'm sorry. Where are you

looking?

MR. KUCHARSKI: It's on page 28 of the manual where it talks about stowage and securing the non standardized cargo. I'm just trying to get my arms around what's standard and non standard on the ship. It talks about portable tanks, tank containers. And then a little bit further down it says Annex four at the bottom of that page, section 5.1 of General where it talks about special wheel-based loading cargoes.

MR. VAN RYNBACH: Could we look at the index at the first page? There may be a separate section -- this is Eugene -- for the roll-on/roll-off cargo.

MR. KUCHARSKI: I can give you the procedure number if you'd like.

MR. VAN RYNBACH: No, no. I'm just looking at the different. So this ship had two types of cargo primarily. One was the container cargo. So the container section of the manual was written for the parts that were containers.

And then there is a separate section. It appears to be -- We're looking at the index on the first page. It says "Stowage and Securing of Row-Row Cargo." So there's a separate section regarding the below deck row-row cargo.

And I think maybe the section we were

looking at before was primarily focused on the container securing which is the above deck cargo. So the ship had segregation of two types of cargo.

MR. SCHILLING: And the non standard cargo would be project cargo that's truly unique. It may only be carrying one piece of it. It could be construction equipment. It could be some other types of heavy lift equipment. It could be military rolling stock. It could be those types of things. Whereas the standard row-row cargo are the trailers, the standard 40 foot trailers, such that they drive on and park.

MR. KUCHARSKI: Great. And in the manual I noticed that inspection of the portable securing devices -- portable I say -- includes wastage. I guess you look at wastage by eyeball.

MR. SCHILLING: This is Spencer. Yes, it's a visual inspection. There's no gauging done of the equipment.

MR. KUCHARSKI: Okay. And on the fixed, I didn't see any treatment of wastage. Is that not required by the CSS or is that any oversight? Any idea on that?

MR. SCHILLING: There are no guidelines on the amount that specifically address the wastage on the fittings. I think in terms of outfit like you would

have for whole structure.

MR. KUCHARSKI: Okay. You said it would be under the whole structure and not relating to the cargo securing or fixed, what they term under the CSS, or in your manual as the fixed part of the cargo securing system.

MR. SCHILLING: Right. There are no specific guidelines on the amount of corrosion that's allowable for the fixed securing devices.

MR. KUCHARSKI: Great. Again, I think -- I don't know where you want to treat this if this is going to be separate. I know the CargoMax has figures for the containers it does it looks like. But I guess the question is the verification of the figures against the cargo securing manual. Is that better held for discussion on CargoMax? I know we treat it under the trim and stability book and CargoMax and the test cases and everything else. Is Eric or --

MR. STOLZENBERG: I would say if this question is related to the line of topic we're on right here let's cover it right now.

MR. KUCHARSKI: I'll mention it and see if we're comfortable then. I know what you talked about earlier on. I think it was Spencer was talking about the surveyor goes on with the test cases and compares

the loading instrument against the trim and stability manual or trim and stability book and verifies that they're correct or within tolerances.

Does that also fall under the checking or comparing the CargoMax to the cargo securing manual? Is that captured somehow there?

MR. SCHILLING: This is Spencer. I can't speak to how exactly the lashing limits for the containers which are calculated in CargoMax are verified against the cargo securing manual limits. So you would have to ask that question of Mike Newton.

In general, the lashing limits or the stack weights shown for containers in this cargo securing manual are samples. It can't by definition really or practicality cover all the possible options of container stack weights. So there are some samples given in the manual that give the crew a general sense for what those limits are. But it's very hard to represent the actual stack weight limits for any given either lashing configuration or any stack weight distribution.

MR. VAN RYNBACH: This is Eugene. I just want to clarify. There are two limitations applied to container stacks. One is the actual physical weight of how much the containers weigh against the strength of

the deck to support that weight. And two is how the different weights of the containers at different tiers compare to the strength of the container to support those weights from the ship's motions.

You have to be a little careful. There is stack weight limitations and tier weight limitations. Stack weight is the strength of the deck to support that weight. And then tier weights is whether or not you have heavy containers on the top or not, restrictions on the weight of the container higher up in the tiers.

MR. STOLZENBERG: And this is Eric Stolzenberg. I'm just going to inject for a moment, Mike, and then hand it back. Just to follow up on what Eugene said, I just want to clarify. So for the weights in the individual containers, if the greatest weight is at the top of a stack, say on the container, that raises the center of gravity of the load and therefore the vessel. And it has an adverse effect on stability. Or why is it that you can't have the height high up? Or does it snap the stay bars or the lower fittings that connect the bottom of the stack to the deck due to accelerations?

MR. VAN RYNBACH: This is Eugene. The latter is the reason. One particular stack will not

affect the stability of the ship. But it could overwhelm the strength of the container at the bottom, its fittings and the lashing bars.

MR. STOLZENBERG: Thank you.

MR. SCHILLING: So maybe I'll need to clarify. This is Spencer. But the lashing limits and the stack weight limits, things given in the cargo securing manual, are there specifically to establish whether the stack is lashed adequately. So it's focused on the strength of the lashing system, the securing system, that's both the fixed fittings, twist locks, and the lashing rods. And that as Eugene has said is very much a function of the weight distribution in the stack as well as the total weight of the stack.

Stability limits are covered by the loading instrument through the methods in the T&S booklet where just the height, weight and CG are covered and added up for the total ship. You come up with the total ship VCG. And the stability is taken separately.

The cargo securing manual is strictly talking about the securing aspects of a given stack or a trailer on the ship to make sure it stays there.

MR. STOLZENBERG: Understood. And I'll hand it back to you, Mike.

MR. KUCHARSKI: Okay. Great. Thank you.

Based on the accelerations. Got it. Are there data submissions that you submit, data along with the approval, of the cargo securing manual?

MR. SCHILLING: This is Spencer. Yeah, if there's enough data in the cargo securing manual to calculate the accelerations and the allowable stack weights and the lashing limits. And that would include the strength of the lashing gear and information on the assumed strength of the containers and then the sample conditions that the weight distribution in the stacks. And that's something that Class can then run in their own program to confirm that those weight distributions do meet the strength requirements.

MR. KUCHARSKI: Okay. Great. So there's no longer supplemental data that's sent along with the manual itself.

MR. SCHILLING: This is Spencer. I don't believe so. No. Check this particular manual, but in most cases the manual itself should provide enough information to verify the calculations.

MR. KUCHARSKI: Okay. Great. Thank you. That's all I have, Eric.

MR. STOLZENBERG: Okay. Thanks. And I'll go to Jeff again to lead off another topic.

MR. STETTLER: Okay. General arrangement

drawing. I know we talked briefly about it. There were a couple of issues I just wanted to try to tie the loop on. What did you use as the basis? You made a original general arrangement drawing, rev zero. What did you use as the basis for that general arrangement drawing?

MR. VAN RYNBACH: This is Eugene. I probably have more knowledge on that. We used the Northern Lights general arrangement drawing as a basis for the El Faro. The Northern Lights being the precursor ship, the roll-on/roll-off ship.

MR. STETTLER: So that being from what year? Like the 1990s?

MR. VAN RYNBACH: 1993.

(Simultaneous speaking)

And I think the format is similar as to the -- We either copied the PDF or we had the auto cad -- I don't recall -- of the Northern Lights.

MR. STETTLER: But you create the -- You have an auto cad now, drawing now. So you created that either by tracing very carefully or some way of creating your auto cad drawing from the old which was probably a fiche drawing.

MR. VAN RYNBACH: Yes.

MR. SCHILLING: Or we had paper drawings.

MR. VAN RYNBACH: Or we had a scanned in copy. Or we had an auto cad. I'm not sure.

MR. STETTLER: Okay. Did you also during that same time frame -- I think the answer to this is no -- do anything or make any changes to either the El Yunque or the El Morro? I think you answered that you didn't have any responsibility for the El Yunque and the El Morro at that time.

MR. VAN RYNBACH: That's correct. We did not.

MR. STETTLER: So you did make any similar -- You didn't create a general arrangement for either of those two at that same time.

MR. VAN RYNBACH: No.

MR. SCHILLING: What same time?

MR. STETTLER: The 2005 time frame, 2006. So this was the first general arrangement drawing for the TOTE vessels that you completed. Is that correct?

MR. VAN RYNBACH: Yes.

MR. STETTLER: I'm looking at the El Faro.

MR. SCHILLING: El Faro, yes.

MR. STETTLER: Thank you. Okay. We touched on this, but I wanted to -- We talked a little bit about validation. And how was the general arrangement drawing validated and compared to the actual shipboard

configuration of the El Faro or the Northern Lights at the time? Was there any effort by anybody as far as you know to validate that general arrangement drawing?

MR. VAN RYNBACH: The draftsman went to visit the ship in 2006.

MR. STETTLER: Does Herbert Engineering have -- Is there a process, a procedure or process, for how that gets done? In other words, is there a checklist or does he keep a log of what he did when he was doing his ship check?

MR. SCHILLING: This is Spencer. For clarification, I think the primary purpose of the ship check was to verify areas that were being modified, not the general arrangement. All the other aspects of that, we didn't go through and verify everything that was given to us on the GA.

MR. STETTLER: Thank you for that. That was an important clarification. So I'm assuming then that Herbert Engineering or the engineer or the draftsman did not go and verify tank locations for example or doing anything or going into the engine room and verifying engine room tanks, anything like that.

MR. SCHILLING: No. We had the drawings, the general arrangement and the T&S booklet and things that outlined all that and we assumed that all that was

good.

MR. STETTLER: Based on your experience as a full service naval architecture firm, if you were to start from scratch and build a vessel or be responsible for a major modification to a vessel, is there a point where a general arrangement drawing should be validated in your view?

MR. FRANCE: In its entirety.

MR. STETTLER: Yes. So here we have this general arrangement drawing. Is there some point in the life of the vessel where that general arrangement drawing should have been validated for bulkhead location, tank boundaries and the like?

MR. SCHILLING: This is Spencer. Our experience is that that's not usually something that is done where areas away from any of the modifications are actually revalidated and checked. I mean it might be common to do an inclining on a basis to verify that because that's something we can change over time. But things that don't change through time like tank boundaries and things like that you pretty much assume that it's as built.

MR. STETTLER: Ultimately going back, you're counting on going back to the builders basically and the validity of their original general arrangement

drawing through the life of the vessel that that general arrangement has stayed. The reason I ask is I have seen some of the older general arrangement drawings and there seem to be some differences in terms of where certain tanks are for example and where those have appeared to have changed over the life of the vessel and it's not clear why or to the extent that they happened.

MR. SCHILLING: Right. So again normally if you're doing something, doing work with a ship, you might check the things that are impacted by what you're doing. Or if you're doing a calculation or an analysis, you check the things related to that.

But you wouldn't necessarily go back and revalidate things that have nothing to do with the changes you're doing. I think it's a fair assumption to make that if the ship's operating in class and Flag's happy with everything on the arrangement drawing that they're working with, the capacity plan, the T&S booklet, are properly representing where the tanks and compartments and other things are. And that was the basis of our going forward.

MR. VAN RYNBACH: This is Eugene. Also that modification was just primarily with deck stowage. We didn't get involved. There was no change in any of the

boundaries inside the ship or engine room or anything like that. So it was a limited modification.

MR. STETTLER: Right. And I do understand that. I'm trying to think back because there were at least two tanks that I know of that are in different locations now apparently than they were in the early 1980s. And it's not clear.

MR. SCHILLING: On this particular ship?

MR. STETTLER: Yes, according to some of the general arrangement drawings. It's not clear why or whether or not -- So it may have been during the lengthening there were changes made.

MR. SCHILLING: During the lengthening they picked it up on the GA.

MR. STETTLER: So we would have to go back and look. But just as a matter of course, you don't -- Herbert Engineering does not do a sight survey and validate all that other than the work you're doing.

MR. SCHILLING: No.

MR. STETTLER: Okay.

MR. SCHILLING: The ship was sailing with the GA and T&S booklet that it had which represented the tanks at the time.

MR. STETTLER: Okay. So there's an underlying assumption on that. Okay.

MR. STOLZENBERG: Can I follow up on that same line?

MR. STETTLER: Absolutely.

MR. STOLZENBERG: I think earlier you mentioned a gentleman that worked in other firms. Is that typical for naval arch firm? Would other firms do a full validation of a GA if they were modifying the chain locker and producing a GA from it? What I'm asking is what Herbert does is that typical for the industry in your opinion?

MR. SCHILLING: Spencer. In my opinion, it's not typical to do that if you're making a modification especially to a very limited part of the ship to validate the entire general arrangement.

MR. STOLZENBERG: Okay. Thank you.

MR. SCHILLING: I mean normally a lot of times in this kind of case you would have taken the paper drawing and just revised the deck area that we were changing and issue a revision. And that's essentially all that was done here. We just redrew it because it was easier to show the change.

MR. STOLZENBERG: Thank you.

MR. STETTLER: And then I guess related questions to the capacity plan which you produced also. What's the basis of that? You used I assume the

general arrangement drawing. What's the relationship between that capacity plan which shows loading, container loading, stowage locations and row-row locations? Is there a relationship between that capacity plan and the trim and stability book? Are they meant -- Should they reflect the same loading configurations?

MR. SCHILLING: This is Spencer. The drawings should typically reflect all the same configurations whether you're looking at the capacity plan or the T&S booklet or the GA.

On the capacity plan, you have additional information on tankages and things like that. And the capacity plan is submitted in support of the T&S booklet. The T&S booklet should show the actual final stowage arrangement.

MR. STETTLER: So they should be consistent. All right. Thank you. I think that's all I have on that topic.

MR. STOLZENBERG: I'll push that around the table on this topic.

(No verbal response)

Anything on the phone, Mike?

MR. KUCHARSKI: No thank you.

MR. STOLZENBERG: Before I go back to Jeff

to lead off the topic, one of the questions that's on my mind is does Herbert do any foreign flag stability work like T&S booklets and loading instruments for nondomestic vessels?

MR. SCHILLING: This is Spencer. Yes, we do.

MR. STOLZENBERG: Are you familiar with those products?

MR. SCHILLING: Well, I speak for the loading instrument side. Certainly the products are sold worldwide.

MR. STOLZENBERG: Okay.

MR. SCHILLING: Distributed worldwide on ships of all flags and class societies really.

MR. STOLZENBERG: One of the things I'm trying to get a handle on is this ship is domestic. And some of the discussion is the difference between domestic rules and foreign rules. In your opinion, are the domestic rules and the products you produce for the domestic market equivalent to the foreign requirements and the foreign products you produce? Are they less stringent? Are they more stringent?

I'm struggling with how to phrase this exactly. But I'm looking for a comparison between what's produced in stability and loading instruments

for a foreign flag vessel under international rules and a domestic vessel. Are they comparative levels of safety? Comparative levels of products? It's an opinion question.

MR. SCHILLING: This is Spencer. Let's just dealing with the product being a loading instrument first. It's the same product that goes out whether it's domestic or foreign. In terms of level of safety, I think you're referring more to the stability requirements, the strength requirements, that would be incorporated in the loading manual and the T&S booklet.

So those are directed by class and by flag administration. So as to the extent that there are differences in U.S. flag requirements for stability and strength than the foreign flag, then that might be a difference in the level of safety.

But in terms of what the loading instrument is really doing, it itself is not a difference. The product is the same regardless of where it goes. Different features are incorporated in the program for different owners, but the fundamental program is the same.

On the engineering side --

MR. VAN RYNBACH: I think currently the U.S. Coast Guard flag state regulations for U.S. flag

stability are concurred with international.

MR. STOLZENBERG: Were they always?

MR. VAN RYNBACH: No. The Coast Guard started accepting international probably late ‘80s, early ‘90sin lieu of the wind heel. The wind heel criteria Coast Guard was a traditional Coast Guard. It goes probably back World War II or previously. And this was mandatory for U.S. flag ships.

But in the late ‘80s, early ‘90s they allowed equivalent calculation under international IMO intact stability codes. And since then they’ve gravitated more and more towards most ships, even U.S. flag, are now all done under the international regulations.

I don’t think any new ship uses the U.S. Coast Guard wind heel. I’m not sure, but none that I’m familiar with.

MR. STOLZENBERG: Okay. Thank you. I push that around the table, that line of thinking or topic.

(No verbal response)

Mike on the phone?

MR. KUCHARSKI: No thank you.

MR. STOLZENBERG: Okay.

MR. STETTLER: I’d like to shift gears if I could and talk a little bit about the actual

calculations that were done to support two documents. One is the inclining experiment that was done on the El Faro in 2005 or 2006. I don't remember the exact date. And the trim and stability book, the calculations to support the development of that book dated 2007.

So how can you utilize computer modeling analysis to complete those calculations to support those two documents? What software package was used to calculate the light ship condition from the inclining and for the necessary intact data for the trim and stability book?

MR. VAN RYNBACH: This is Eugene. A program called HECINCLINE, I-N-C-L-I-N-E, was used for analyzing the incline test data. And then it generates the light ship from the input data including the offsets, the hydrostatics of the vessel.

MR. STETTLER: Is that a modification of HECSALV?

MR. VAN RYNBACH: Yes.

MR. STETTLER: What's the relationship?

MR. VAN RYNBACH: Well no.

MR. SCHILLING: Let me clarify. This is Spencer. HECINCLINE program was written for the U.S. Coast Guard for doing their own inclining on their own boats. And it also was released commercially, although

our primary user is the Coast Guard and anybody that inclines Coast Guard vessels.

MR. STETTLER: Okay.

MR. SCHILLING: The HEC continues to use it internally and has maintained it. It's a separate program from HECSALV. It's not -- And it doesn't do -- I think the actual hydrostatic calculations has been incorporated as an option using the HECSALV engine. But otherwise it doesn't share any code with HECSALV.

And primarily again for the incline program, it's a tabulation of weights (Inaudible) So it's just a dead weight summary spreadsheet type form. And it allows you to enter the weight movements and the pendulum readings in order to calculate the tangent of the movement curve and you get the --

MR. STETTLER: So it does the plot.

MR. SCHILLING: Right. And the draft and freeboarding interpellations.

MR. STETTLER: The calculation engine, is it using the same HEC model that the lines and stations and offsets in the same model?

MR. SCHILLING: It has the capability to use it. It can also take manual entry of hydrostatics to determine in some other way. Maybe from the hydrostatic table, it might just use --

MR. STETTLER: Do you know which of those was done on the El Faro?

MR. SCHILLING: I don't recollect.

MR. STETTLER: So similar question for the trim and stability book, the calculations that were done to support the trim and stability book. Spencer, I think you had mentioned in your email to me that the GM curves are actually a fairly straightforward calculation based on the wind area. And you actually have a spreadsheet that does that calculation. Otherwise, what software was used for most of that?

MR. SCHILLING: Again, to get to the required GM curves, that was the spreadsheet formula that we used.

MR. VAN RYNBACH: This is Eugene. The actual calculations are in that document submitted to ABS. The wind heel calculations which you referenced it earlier.

MR. STETTLER: For the CargoMax.

MR. VAN RYNBACH: For the CargoMax.

MR. STETTLER: Okay.

MR. VAN RYNBACH: It's basically that. That's the calculation.

MR. STETTLER: In that document, okay. So that was done in CargoMax as opposed to --

MR. VAN RYNBACH: Well, it was done in Excel, but that document used in support of CargoMax basically represents the same values.

MR. STETTLER: So in the case of CargoMax then, the model that is the basis for the hydrostatic cables and the tank capacities and all that in CargoMax, yes.

MR. SCHILLING: I'm sorry to interrupt. This is Spencer again. Just to clarify it, part of the question related to the intact GM curve which was a spreadsheet calculation.

MR. STETTLER: Right.

MR. SCHILLING: To calculate that. As I explained earlier, it's a simple function of the wind area moment and the heel angle to get you to a certain or a heel angle, right. So that's a spreadsheet calculation.

We did that calculation to check the El Faro. We compared that to the other sister ships and they're almost identical. I think we might even have used the same curve that was in the El Yunque and El Morro booklet.

MR. VAN RYNBACH: Yes.

MR. SCHILLING: Because they were the same. It turned out to be. But for the other parts of the

T&S booklet, the hydrostatic tables to calculate the GM of the ship, they're either the previously existing hydrostatic tables or -- And I think they are actually. So they weren't generated from HECSALV. We just used the hydrostatic tables that were already in the T&S booklet to reflect the current hull form.

MR. STETTLER: So produced by another firm.

MR. SCHILLING: Whatever.

MR. STETTLER: So that was part of what I was getting at. What was the basis for the data in the trim and stability book?

MR. SCHILLING: Right.

MR. STETTLER: So I think you're stating to me that it was done previously.

MR. SCHILLING: I believe so. I'd have to go back and confirm that. But I think it was what was in the previous version. We could just compare the two tables and see.

MR. STETTLER: So we don't know --

MR. VAN RYNBACH: That's true. This is Eugene.

MR. STETTLER: -- what that was based on then.

MR. SCHILLING: No.

MR. VAN RYNBACH: It was based on the

previous manual. The changes that were made were just pages that were inserted into the existing manual. It was not an all new manual.

MR. STETTLER: Okay. Very good. Actually that adds another layer to this. But then so CargoMax is based on a computer model that stations and offsets and tanks that are modeled. And then for the intact version of CargoMax uses look-ups and the like unless the damage module is being used.

What is the basis for that model? So the model from which the CargoMax, the onboard installation on the El Faro, was built? What was the basis for that?

MR. SCHILLING: Again this is Spencer. You have to check with Mike Newton to be sure.

MR. STETTLER: Okay.

MR. SCHILLING: But my understanding is that in keeping with the tenets of the T&S booklet was using the hydrostatic table from the T&S booklet.

MR. STETTLER: Okay.

MR. SCHILLING: It's possible that hull offsets were used and the calculation was done. But again it was probably if there's only a zero trim, even keep, hydrostatic table in the T&S booklet that was used in CargoMax. Right. And so the values just like

in the T&S booklet were interpellated directly off of that table rather than integrated directly on the hull offsets of the given trim (Inaudible)

MR. STETTLER: Okay. Very good for now. Thank you.

MR. GRUBER: Tom Gruber. Just to go back on the calculations for the required GM curves based on the wind heel. Did you run separate calculations and submit them for review? Or did you just use the curves from the sister vessels and submit them in the T&S booklet that way?

MR. SCHILLING: This is Spencer. We checked the curves in-house with our calculations spreadsheets again, verified that the existing curves from the sister ships were matched. And then we just submitted them in the T&S booklet because they were essentially the same curves in the approved T&S booklet from the sister ships.

MR. GRUBER: Okay.

MR. SCHILLING: We did not submit a separate document that gave the background for the curves.

MR. VAN RYNBACH: I think we did -- This is Eugene again -- in the CargoMax justification. There are whole tables where all the different curves are derived.

MR. GRUBER: But the question is though when the T&S booklet --

MR. VAN RYNBACH: The T&S booklet, no.

MR. GRUBER: So there is not a separate stamped document of approved calculations for the El Faro. Or it's actually based --

MR. SCHILLING: For the intact stability.

MR. GRUBER: For the intact.

MR. SCHILLING: I don't believe so, no.

MR. GRUBER: Okay.

MR. VAN RYNBACH: But we did confirm though internally. We made the same calculation independently and we came up with a one percent ourselves.

MR. STETTLER: Using HECSALV?

MR. SCHILLING: No, the spreadsheet. That was our spreadsheet calc.

MR. STETTLER: Using the hydrostatic tables.

MR. SCHILLING: It doesn't even use hydrostatic tables. The intact.

MR. STETTLER: Oh, just using -- Just to get the GM. Got it.

PARTICIPANT: Uses hydro displacement.

MR. SCHILLING: Displacement, yes. Sorry.

MR. GRUBER: Did you have anything on this? Any more?

MR. STETTLER: I think I'm done on software. I think my last bit will be structural related questions.

MR. GRUBER: Tom Gruber. On the inclining experiment, did you calculate the transverse center of gravity of the ship?

MR. VAN RYNBACH: This is Eugene. I don't recall. We'd have to look at the results.

MR. GRUBER: Would you normally in a standard review of a general cargo ship calculate the transverse center of gravity? Or would it just be limited to weight, vertical center and longitudinal center?

MR. SCHILLING: It would normally be calculated through the inclining process. If the existing T&S booklet and things don't have any way to use that it may not be carried forward in the T&S booklet. Previously if they had not TCG calculations and it wasn't carried forward, it's possible it wasn't carried forward into the T&S booklet with the most recent incline. So whether it was calculated or not should be clear enough in the incline report.

MR. GRUBER: Again, Tom Gruber. Going further into the CargoMax program, if it was calculated, would it be included in the CargoMax? Is

it normal to include it in the Cargo Max program?

MR. SCHILLING: I mean it's possible. Again, the baseline would be to try and match what the T&S booklet had. If the T&S booklet had TCG, the CargoMax should definitely have TCG.

If the T&S booklet doesn't have TCG, it's possible that the CargoMax might include TCG as an additional piece of information. But I'd have to go back and see. I mean because it's -- These days it's typical to have TCG because more and more ships have TCGs. But certainly in years past, it wasn't always the case.

Again, on an old ship with a conversion whether it was added into CargoMax when it wasn't in the T&S booklet, I can't say that's typical.

MR. GRUBER: Again Tom Gruber. If it was not -- If the vessel had a TCG and it wasn't included in CargoMax, what effect would that have on the loading conditions compared to the observed ship condition once she was loaded? If you could just explain it. Do you understand the question?

MR. SCHILLING: Yeah. It will impact the static heel line.

MR. GRUBER: How? What would -- Can you be a little more specific?

MR. SCHILLING: Okay. The transverse center of gravity, the TCG, is used to calculate a heeling moment, a static condition. And so that would be reflected in the difference in port and starboard drafts (Inaudible) heeling and that they might observe.

MR. GRUBER: Thank you.

MR. VAN RYNBACH: Hold on. This is Eugene. If you go -- If you look at the inclining experiment report.

MR. STOLZENBERG: And this is from 2006.

MR. VAN RYNBACH: Yes. The TCG is calculated for the light ship based on the measurements. We're looking at the condition one which is light ship.

MR. GRUBER: What page?

MR. VAN RYNBACH: On page 17 of the PDF file.

PARTICIPANT: Actually I apologize. Actually that's my note on there.

MR. GRUBER: Okay.

PARTICIPANT: And actually this is one of those things. There is actually a tank that's in the wrong place. So that affects this. So it's close to zero.

MR. VAN RYNBACH: Also what CargoMax does -- if you look at an output from CargoMax, if we have a sample output -- that would tell you whether or not transverse center of gravity is calculated. So we could check that immediately.

MR. SCHILLING: Right.

MR. FRANCE: In CargoMax.

MR. VAN RYNBACH: Yes, if we have a sample output.

MR. FRANCE: Yes, I can provide that. I assume we can do this, sir.

MR. STOLZENBERG: Yes.

MR. GRUBER: These conditions in the T&S booklet are CargoMax output.

MR. VAN RYNBACH: No, that's the T&S booklet.

PARTICIPANT: So this is actually at departure.

MR. STOLZENBERG: Slow down a minute. If we're going to look at a document, we've got to take the time to say the document we're going to look at and just as housekeeping rules and give the file name and the document we're talking a look at and the page.

So we're talking a look at the CargoMax printout 10 of 115 rev one PDF and we're on voyage 185

and it's printed on October 1 at 11:48 a.m. And it's for the El Faro. And we are looking at the departure trim stability summary Jacksonville final.

MR. VAN RYNBACH: This is Eugene. And it does show that the transverse center of gravity is calculated for the various weight components to come up with a total for the ship. And then possibly could you scroll down a little bit?

MR. STOLZENBERG: Sure.

MR. VAN RYNBACH: There is also a predicted angle of heel probably. Yes. If you look at the stability output, the trim calculation on the right side of the page indicates a predicted list of 2.29 degrees to starboard. So that's typically a standard feature in CargoMax to try and calculate the ship's static heel.

MR. GRUBER: But if the TCG is omitted, if there is a TCG to one side or the other, then this list is going to be incorrect.

MR. VAN RYNBACH: A TCG of what?

MR. STOLZENBERG: The light ship.

MR. GRUBER: The light ship TCG.

MR. VAN RYNBACH: Yes.

MR. SCHILLING: This is Spencer. Again using the source as the T&S booklet which didn't list

the TCG because it hadn't been in that book ever before and I don't think the hand forms do TCG calcs, when they put CargoMax together they didn't have information on the TCG for the light ship assuming it was zero. That's my speculation.

MR. VAN RYNBACH: But we know that it's very close to zero.

MR. SCHILLING: Yes.

MR. VAN RYNBACH: From the incline.

MR. O'MEARA: This is Dennis. Just so I understand it better, we previously had heard in other interviews that the vessel load limits that they used at the dock were 100 times of available dead weight, a half of foot of GM margin and zero degrees of list. Those were the desired conditions.

And it sounded -- at least I came across as -- that that was what they used all the time. Would there be any forcing function to improve on those limits if you anticipated weather conditions that were going to be particularly severe? Is there anything that would say 100 tons of available dead weight is too small? Or a half of foot of GM margin is too low?

Would there be a rationale to say under certain conditions we might not want to use those as the limit? We might want to make it more stringent.

MR. SCHILLING: This is Spencer. Certainly owners are free to apply any additional margins or set those sorts of criteria which are above and beyond what the regulations require. So when you say a half of foot of GM margin, that's margin above the required value which might be three, four or five feet. And likewise the dead weight margin just to give you a little bit and make sure you're not exceedingly your load line and give you some margin in that.

And some of that is done so that if there are any slight differences in the calculated value versus the observed draft value or some hull deflection and things like that, you can make sure that your marks aren't under and those kinds of things.

But there is no guidance in the rules or any that are typically applied based on the rules and what the rules are based on that are given to operators to say in a certain weather conditions you have to exceed what the rules require.

There is no standard guidance like that. There's none ever given really from the direction of the booklet's requirement. The requirement is what it is. And if you meet that, you satisfy everything. To the safety level, that was determined adequate when the rules were put together.

MR. O'MEARA: Okay. Thank you.

MR. VAN RYNBACH: Excuse me. Can I go to the men's room?

MR. STOLZENBERG: Let's go off the record for a moment.

(Whereupon, a short recess was taken)

MR. STOLZENBERG: This is Eric Stolzenberg. The time now is 1515. We're back on the record at Herbert Engineering in Annapolis.

Jeff.

MR. STETTLER: Okay. I'd like to actually change gears and talk a little bit about structures. I've basically got two lines of questioning or two questions related.

Spencer, based on an earlier email from you the other day you stated or you told me or the Coast Guard that or understand that HEC did not perform any structural analysis of scantlings including the hull (Inaudible) section modules and buckling assessments other than the deck modifications you did in 2005 to strengthen the deck. You had stated that you had done analysis of the deck including (Inaudible) analysis.

But you did not do any either global or hull girder or section modules calculations or buckling analysis. You used the allowable bending moments that

were provided based on previous documentation.

Under what circumstances would Herbert Engineering doing this type of work would have done your own hull girder section module and buckling assessment of a ship like this?

MR. SCHILLING: Yes, this is Spencer. Again with this modification we were making, we weren't impacting any of the hull girder strength. The analysis we did for the main deck was simply to look at the local loads from the container stacks. What we reinforced was not anything that impacted section modules, but rather local beam flanges we put riders on (inaudible) on those or reinforced a pillar that was taking a vertical load down into the ship's structure. So all of the analysis was related to the container loads transferred into the hull structure and not related to bending moment.

The distribution of containers on deck certainly impacts bending moment. It impacts the loads on the hull girder bending loads in the hull. But that's accounted for in the loading manual, the assessment of bending moments, through the normal process and in CargoMax. And you use the assigned allowable bending moments which are based on the hull structure to set the limit on how the container load

can be loaded.

Again, we weren't touching anything that impacted hull girder section modules. And so there was no need to reassess the allowable bending moments that were assigned by Class.

MR. STETTLER: Were you aware of any such analysis being done? Did you see any references as you were going through and preparing your work that a hull girder section module and a hand buckling analysis had been done on the hull previously?

MR. SCHILLING: None for the El Faro. I couldn't find -- and I don't recall -- any calculations of the hull girder section modules and the distribution of the allowable weight bending moment. We have some documentation that says what the allowable bending moment is midship. And when the ships were built, all they did was apply a midship value.

But I couldn't find whether we did any calculations that calculated section modules at various locations and calculated the distribution of the allowable bending moment. I just don't recall it and can't find anything in our files

On the Great Land, we did some scanning recesses and I think I've provided those reports. And in there we take a look at some of the buckling

strength of the bottom structure and inner bottom structure as designed for the allowable bending moment I think just to check and see how it was doing. At that point, they were looking at how much we had done in structure in the inner bottom.

The double bottom is transversely framed as is the side shell. And they've got a floor at every frame. So there's a lot of redundant structure for local and secondary loads in cargo hulls and tanks. But because it's transversely framed, it's a little more susceptible to buckling. So we checked to make sure in at least that basic buckling criteria at that point we satisfy ourselves that it did. But there was no need for us to reassess the (Inaudible)

MR. STETTLER: This is Jeff Stettler again. Was that the Great Land? That analysis you did on the Great Land was that before or after. I know Herbert Engineering had done an analysis on the Lauraline which I think is a pseudo sister vessel that had some different arrangements. Are you familiar with the analysis Herbert Engineering did on the Lauraline?

MR. SCHILLING: This is Spencer. I recollect that we worked on that. I don't remember when the analysis was done. Now the Lauraline was completely converted and gutted. A full container

ship. So it no longer has any row-row capacity in the cargo holds. It has some row-row capacity in the stern. But the entire inside of the hull was gutted and turned into a container ship.

MR. STETTLER: I'm actually going to not -- Mike Venturella had sent a question along those lines. I just want to make sure that there wasn't something else in there. I'm going to pass to Tom if you have a follow-up question.

MR. GRUBER: Tom Gruber. The Lauraline also had a different length which would have affected the calculations, correct?

MR. SCHILLING: Okay.

MR. GRUBER: I think the mid body that was added was a different length. Would that have affected the calculations and their transference to the El Faro and those similar hulls?

MR. SCHILLING: This is Spencer. It could. It depends what calculations we're talking about. In terms of the buckling capacity, maybe not because that's based on local plate thickness and stiffener space and things like that. If it's in terms of the actual bending moments that were generated in those bottom plates and things, yes. That could certainly affect that.

But I don't have a recollection of the actual length. And it was completely converted and taken out of this row-row service.

MR. GRUBER: Thank you.

MR. STETTLER: I just looked at Mike Venturella's question and I think we've answered this already. So thank you.

MR. STOLZENBERG: This is Eric Stolzenberg. Just to go back a little along the same lines, what structural criterion was in effect or what was required by Class and the Coast Guard for the El Faro?

MR. SCHILLING: Well, the structural criteria is ABS Class rules.

MR. STOLZENBERG: Okay.

MR. SCHILLING: So those are in effect and it was of course designed to an old set of rules back in the '60s or '70s. That wouldn't be the applicable rule at this point. They didn't -- As a rule changes, they grandfathered ships in. And they're not required to the new rules automatically.

MR. STOLZENBERG: So even in 1993 when it went through a new inclining and had new intact and damage stability analysis it wouldn't have to meet a different structural year requirement from the ABS Class.

MR. SCHILLING: It was a major conversion and certainly when they're looking at longitudinal strength and things like that or updating bending moments, whether those requirements are reassessed what the ship's capacity was. Well, it was a need to make sure that the strength capacity was appropriate for the length.

Part of the conversion for mid body is adding strapping and everything else to handle the higher loads. So it's not just in the mid body, but beyond the mid body and the deck and in the bottom to increase the section modules to get the strength that you need for the longer ship. And that's all done. So that's brought up to the requirements of the bending moments at the time.

MR. STOLZENBERG: And so when Herbert comes in in the mid 2000s you're looking at documents generated back from the '70s or documents from the '93 conversion regarding structure, the whole group of section modules.

MR. SCHILLING: I think that the bending moment we used was on the scanning plan of the midship section from '93.

MR. STOLZENBERG: Okay.

MR. SCHILLING: I think there's an allowable

bending moment listed there. And it was the same as the El Yunque and El Morro. I'm pretty sure.

MR. STOLZENBERG: And that can be found in the documentation, right? It would be a reference or.

MR. SCHILLING: Yes, it's on the scattling (phonetic) plan for the conversion.

MR. STOLZENBERG: Okay. That's all I have on that line. Mike, any questions regarding these topics?

MR. KUCHARSKI: No.

MR. STOLZENBERG: Okay. I'll go to Jeff again.

MR. STETTLER: Actually that was it for structures. Does anybody else want to discuss anything with structures?

MR. GRUBER: No.

MR. STETTLER: I've got two other relatively minor. Did the general arrangement drawing list a fire control and safety plan as a reference? And from the number it looked like that was something that Herbert Engineering produced. Is that something you have available today and could we request a copy of that, maybe an electronic copy?

MR. VAN RYNBACH: We have a copy printed and electronic if you would like.

MR. STETTLER: Okay. Yes, that was not specifically on our request list. And I noticed looking at the drawing that it was listed in the reference. And that's something that's missing from our files. So if I could request that from you, that would be helpful.

MR. SCHILLING: As a typical process, we just copied TOTE on anything we sent because officially they own all of this material.

MR. STETTLER: Right. I believe that was requested from TOTE and TOTE couldn't find it or wasn't able to -- So I'm happy you guys had it. So that was actually a Herbert Engineering drawing, correct?

MR. SCHILLING: I believe so, yes.

MR. STETTLER: Similar to (Inaudible)

MR. VAN RYNBACH: What format would you like, electronically or?

MR. STETTLER: PDF would be fine. Like this, that would be fine.

MR. VAN RYNBACH: Okay.

MR. STOLZENBERG: What's the name of that drawing?

MR. O'MEARA: (Inaudible) control and safety plan. Will you be sending a list to request this sufficiently or should I just make it up?

MR. STETTLER: I can send out an additional list.

MR. O'MEARA: Thank you.

MR. SCHILLING: There were a few things that I wanted to talk to you about that we didn't get.

MR. STOLZENBERG: Okay. We'll double check because for some reason that plan also rings a bell. We may have it, but I'll certainly let you know.

MR. STETTLER: I haven't seen it in going through the --

MR. STOLZENBERG: This is Eric Stolzenberg. I'd like to go to a question about CargoMax and strength. You know looking at the CargoMax output it does provide a sheer force and bending moment maximum limit. I believe in some of the test cases in the manual it shows it as exceeding of the limits. Just briefly, how does CargoMax calculate the sheer force and the bending moment in the program in general?

MR. SCHILLING: This is Spencer. Yes, it's just a fundamental calculation of the weight force and weight moment -- I'm sorry. The weight force and buoyant force at a given frame. If we think about a midship, it adds up all the buoyancy aft the midship and all the weight aft of midship and the difference gives you a sheer force.

And for the bending moment, it calculates the moment of that weight aft the midship. So that weight has an LCG and it gives you a weight moment. And the buoyant moment, same thing. It's got an LCB and you've got a buoyant volume weight displacement and that gives you a buoyant moment. The difference is the bending moment.

MR. STOLZENBERG: Okay. Another question I have along the same lines is what's the practical implication of exceeding those limits to your knowledge. In other words, if it's exceeded by 10 percent what happens? And I realize this is an opinion question again. What kind of margin of safety is built into those?

(Simultaneous speaking)

Clearly it's an opinion question.

MR. SCHILLING: This is Spencer. I think it's important to understand that these are the allowables that are in the manual which are the still water allowables. So those calculations for buoyancy are done at a still water line, the current draft and trim. So it's called the allowable still water moment.

And to that, you have to add a wave bending moment to get the total moment that's applied to the hull girder. And it's that total moment that you have

to compare to the actual structural capacity of the hull.

And typically the wave bending moment by rule is in a range of or can be equal to the still water allowable moment. So the total structural capacity of the hull can be twice that the still water allowable is shown.

And in fact there is a still water allowable for at sea. So when you go to sea it gets that full margin on it for the potential wave moment.

There's also an in harbor allowable sometimes. And I'm not sure if the El Faro has an in harbor allowable. That just takes away that wave component. And you can also load a ship up to allowable bending and in harbor as you do at sea.

But in both cases it's well below the structure capacity of the ship. And it's the addition of a wave moment that has the potential to push it to something over the structure capacity of the ship.

MR. STOLZENBERG: Okay. You answered my next question. How are the margins of safety considered for that?

MR. SCHILLING: The structural capacity of the ship in the rules is that a certain allowable stress that also includes safety margins in it.

Certain capacity, they use the strength of the material or in other cases, the buckling capacity shift the margins on that, too. So that weight, that total capacity, is not figured as the absolute expected failure point. There is some margin in that, too.

MR. STOLZENBERG: And I assume there's room for wastage of steel to a certain degree as well in addition.

MR. SCHILLING: Right. In the rules. The rules under which this was built and served, all the calculations for section modules and structure capacity are based on the as-built or gross scantlings. And those include margin for corrosion. It's not explicit. But there's some margin for corrosion.

That corrosion margin is controlled by the wastage allowances specified in the rules to be checked in service. So when they go do a survey and they do gaugings of your steel plate and things like that, they know they can go to 20-25-30 percent of the as-built thickness and the structural capacity is assumed to still be adequate based on rules it was built to.

MR. STOLZENBERG: When you say rules, you mean Class rules?

MR. SCHILLING: Yes.

MR. FRANCE: I think you said 25 percent of

the as-built. Twenty-five percent wastage from the as-built.

MR. SCHILLING: That's correct.

MR. FRANCE: Not 25 percent of the as-built.

MR. SCHILLING: Correct.

MR. FRANCE: And also I think ABS in their analysis of gaugings normally allows 10 percent reduction in the overall section module strengthened in a frame due to wastage.

MR. SCHILLING: So the local wastage issue may be 25-30 percent. It's again the diminution amount of 25-30 percent and there's a global hull girder corrosion allowance built into 10 percent reduction section modules. You can't go below that in any case.

MR. STOLZENBERG: All ask anyone. Mike on the phone, any questions along those lines?

MR. KUCHARSKI: Negative.

MR. STOLZENBERG: Why don't we just follow up along same type of thinking. We're talking about Class again.

From your perspective, is there any change in stability and structural requirements when a vessel moves from Coast Guard regulated to the alternate compliance program where ABS takes more of the load? And what kind of changes do you see at a naval

architecture firm level? Or is it the same? I'm just looking for some ideas on how it works. What kind of changes is it for a naval architecture firm for a vessel that moves from Coast Guard regulated to alternate compliance program with Class?

MR. SCHILLING: This is Spencer. I mean there are no changes in the requirements, stability requirements, strength requirements. Well, there's a supplement for some differences. But for the most part it's just like changing process. We just submit the drawings to the different organizations to do the approvals.

MR. STOLZENBERG: Just excuse my ignorance. So for a Coast Guard traditionally regulated vessel, you would go to the Marine Safety Center of the Coast Guard or the OCMI. And now the majority of these documents go to ABS.

MR. SCHILLING: Right. For basic stability and strength issues, it's a procedural change. There's a supplement for ABS and for the Class societies doing an ACP program that covers differences in the rules. And it's mostly equipment system and some material related issues and not fundamental stability and strength related issues.

MR. STOLZENBERG: Okay. Thank you. Any

other questions along those lines?

MR. GRUBER: No.

MR. STOLZENBERG: I guess I'll follow up again. The same line of thinking in general just because we have naval archs here. Do you work with other Class societies other than ABS?

MR. SCHILLING: Yes, we do design work that is approved by other Class societies.

MR. STOLZENBERG: Is there a difference, a fundamental difference, between DNB, Lloyds, Reno (phonetic) or other class societies regarding stability and structures than ABS in your opinion and experience?

MR. SCHILLING: This is Spencer. So you have to look at them differently. Stability traditionally is not a class function. Stability is primarily a flag state IMO function. So the Class size are basically checking against those requirements. There may be some cases where the Class has guidelines and things that suggest. But stability is primarily not a Class function.

All the structure and systems and equipment are more in the realm of Class. And the major Class societies agree pretty much on all the primary structural issues. I mean there's IX and they coordinate all the harmonization and all the structural

rules and things like that.

Even a number of years ago they brought together their calculations for rule on bending moment for instance and things like that. They brought them close. And the basic way they approach hull girder strength and (Inaudible) water moments and things like that are similar. They're not precisely the same in all cases, but they're similar. Certainly for tankers and bulk carriers, they're identical now because they have the harmonized CSR rules.

MR. VAN RYNBACH: Common structure.

MR. SCHILLING: Common structure rules. So we don't see big differences in that. Again, way back there used to be differences in local scantling requirements and other things that dealt with side shell framing and the details of the GMLs and things like that. Buckling analyses were different. But they're coming more and more in a similar mode.

MR. STOLZENBERG: Okay. Thank you. That's what I was looking for to get an idea of where we've been and where we're going and what differences there might be. Again, I'll kick that line around the table and to Mike on the phone.

(No verbal response)

MR. KUCHARSKI: Nothing on the phone.

MR. STOLZENBERG: All right. Then I'd ask. It seems like we're wrapping up, but I'll go around. Dennis, any issues you have?

MR. O'MEARA: None.

MR. GRUBER: None

MR. STETTLER: The only thing is there was a line of questioning that I think relates more specifically to some of the details of CargoMax that I'd like to address. I think based on our discussion this morning that we include we probably need to maybe get Mike Newton on the phone or something.

And I would like to propose to Mr. Stolzenberg maybe we set up a separate time for that. I think we could probably do a phone interview. A lot of it is housekeeping and just to clarify a few issues specifically with CargoMax. Does that sound reasonable to everybody rather than trying to address it here today?

MR. SCHILLING: This is Spencer. I would think so. I mean because in terms of actual implementation of the CargoMax and what went on in that process and when it was updated and things like that he would have a much better handle of it. I don't know if he was in charge of doing it for the ship. But he would be in a position to find out.

MR. STETTLER: Okay. Just based on what you said today, I think he'll probably be able to answer most of it.

MR. SCHILLING: I haven't been directly involved with software since 1999

MR. STETTLER: Right.

MR. STOLZENBERG: Okay. That sounds good. We can do that. Anything else, Jeff?

MR. STETTLER: No.

MR. KUCHARSKI: Mike on the phone, any issues or things we haven't covered that you'd like to address and cover now please feel free.

MR. KUCHARSKI: No, that's it. Thank you. I support the follow-up from CargoMax as separate for that.

MR. STOLZENBERG: I have one more and then you'll get the last word like you mentioned at lunch.

MR. FRANCE: That's always what I want.

MR. STOLZENBERG: One thing I'd like to ask. Is there anything that we didn't ask that was important to ask regarding strength stability today that we don't know that would be good for us to know or things that are on your mind that we should know? I throw that out there for you to take the floor.

MR. SCHILLING: This is Spencer. I don't

think there's any questions that you didn't ask. It was interesting. I understand on the procedural issues and documentation of how important that is.

But in my mind coming from the stability and strength not much of it was related to what actually caused the casualty on the date of the event. And our biggest curiosity is what was the intact loading condition when it left and how does that relate to things. We haven't seen any of that. So we have no way to analyze what was going on because we haven't seen that information. So that's the remaining big curiosity on our part is to be able to take a look at that and seeing what the situation was.

I don't have any other. I don't think there are any other questions to pursue with us.

MR. STOLZENBERG: How about do you have anybody or know of anyone else we should interview? I know we brought up Mike Newton. Is there another individual you've run into in the past who might have some knowledge of the vessel or technical information that we should at least speak to them about? And not necessarily from Herbert either. Just in general.

MR. SCHILLING: I've tried to go back through the records and find out what we did for the El Faro and see what was going on and talk to people in

the office about what was happening. I don't know -- I think I've actually got the bigger and best picture overall. I don't think you need to see anybody else. I don't know if I can recommend somebody else.

MR. STOLZENBERG: Okay. That's fine. I just like to check because we don't know what you know always. And if you had a pertinent individual that had done work at a certain time and now works for another organization if that can be helpful.

So very well. I'll go around one last chance and then Willa and we'll wrap it.

MR. FRANCE: Having now appeared in the NTSB proceeding on behalf of Herbert, this was a question that came up in the Coast Guard telephone conversation the other day. So far as further communications are concerned, I'm quite happy that you guys communicate the way you have been with Spencer because you have seemed to build up a rapport. You know what each is thinking about and so on. That's fine with me. Just copy me as the attorney. Okay. Is that an appropriate request to make?

MR. STOLZENBERG: I think under our rules we can.

MR. FRANCE: Okay. Fair enough.

MR. STOLZENBERG: I will double check with

my GC. I don't think it's an atypical request. But I'm going to double check before I commit.

MR. FRANCE: All right. That would be the only thing I would have.

MR. STOLZENBERG: Thank you. Noted and I will follow up on it. Okay. We're going off the record. The time is now 1541. Off the record.

(Whereupon, at 3:41 p.m., the above-entitled matter was concluded.)

C E R T I F I C A T E

MATTER: El Faro Incident
October 1, 2015
Accident No. DCA16MM001
Interview of Eugene Van Rybach/
Spencer Shilling

DATE: 01-28-16

I hereby certify that the attached transcription of page 1 to 169 inclusive are to the best of my professional ability a true, accurate, and complete record of the above referenced proceedings as contained on the provided audio recording; further that I am neither counsel for, nor related to, nor employed by any of the parties to this action in which this proceeding has taken place; and further that I am not financially nor otherwise interested in the outcome of the action.

[redacted]

Exhibit A

[redacted] 1/29

ABS AMERICAS
A DIVISION OF THE AMERICAN BUREAU OF SHIPPING
ABS Plaza, 16855 Northchase Drive, Houston, TX 77060

TELEFAX

[redacted]

DATE:	29 December 2005	PAGE:	1 of **1**
TO:	Herbert Engineering	FILE REF:	S-1
ATTN:	Mr. Eugene Van Rynbach	REFER TO:	PB
FAX NO:	By e-mail	PID:	
FROM:	Thomas M. Gruber	CC:	ABS Mobile - C. Barry

SUBJECT: "NORTHERN LIGHTS" ID 7500285
Sun S/B Hull 670
1966 Load Lines – Preliminary Freeboard Assignment

The requested 1966 type "B" preliminary freeboard assignment (based on sister vessel, EL MORRO, hull 666) is as follows:

Center of Ring below upper edge of Deck Line	: 12'-0-15/16"
Deck line located opposite top of steel 2nd deck at side	
Tropical-Fresh above Center of Ring	: 1'-3"
Fresh above Center of Ring	: 7-1/2"
Tropical above Center of Ring	: 7-1/2"
Summer through Center of Ring	: ------
Winter below Center of Ring	: 7-1/2"
Winter North Atlantic below Center of Ring	: N/A

Midship point located 12-1/2" FWD of Fr. 134/8	Load Line Length: 736.75'
Corresponding Molded Draft: 30'-1-5/16"	Extreme Draft: 30'-2-3/8"

These marks are forwarded at the shipyard request in order to mark the vessel's sides while in the shipyard. The marks actually assigned to the vessel will be based upon the final stability approval letter issued by this office and may differ from those indicated above. If the owner wishes to put the above marks on the vessel, they may do so at their risk. ABS assumes no responsibility should the load line marks change. The official assignment will be made after our final review of the vessel's stability.

If you have any questions, please feel free to contact this office at any time.

Best regards

[redacted]

Thomas M. Gruber
Principal Engineer,
Ship Engineering Department

Exhibit B
[redacted]
1/29
PS 1

TRIM & STABILITY BOOKLET

S.S. EL YUNQUE

(ex KAIMOKU)

O. N. 573,223

Issued	8 June 1990
Revised	26 September 1990
Revised	28 April 1995
Revised	9 August 1995
Revised	3 December 1998
Revised	5 January 2001

SEA STAR LINE , LLC

REVISED BY:
TIDEWATER NAVAL ARCHITECTS, INC.
PORTSMOUTH, VIRGINIA

Exhibit B

[redacted] 1/29 Pg 12

IX. WINDHEEL REQUIRED METACENTRIC HEIGHT (GM_T)

CONTAINERS ON DECK

MEAN DRAFT (ft)	BARE HULL (ft)	1 TIER (ft)	2 TIERS (ft)	2 TIERS EXCEPT 3 TIERS ROWS 16-19 (ft)	2 TIERS EXCEPT 3 TIERS ROWS 12-19 (ft)	3 TIERS (ft)	3 TIERS ROWS 1-7 4 TIERS ELSEWHERE (ft)	3 TIERS ROWS 1-4 4 TIERS ROWS 5-9 5 TIERS ELSEWHERE (ft)
30.84	1.89	2.51	3.19	3.42	3.63	3.97	4.59	5.32
30.00	1.86	2.47	3.13	3.36	3.56	3.90	4.51	5.22
29.00	1.84	2.44	3.09	3.31	3.52	3.84	4.44	5.14
28.00	1.83	2.42	3.07	3.29	3.49	3.81	4.40	5.09
27.00	1.84	2.43	3.07	3.29	3.49	3.81	4.40	5.08
26.00	1.85	2.44	3.08	3.30	3.50	3.82	4.40	5.08
25.00	1.88	2.47	3.12	3.34	3.53	3.85	4.44	5.12
24.00	1.91	2.51	3.16	3.38	3.58	3.90	4.49	5.18
23.00	1.95	2.55	3.21	3.44	3.64	3.96	4.56	5.25
22.00	2.00	2.62	3.28	3.51	3.72	4.05	4.65	5.36
21.00	2.06	2.69	3.37	3.60	3.81	4.15	4.77	5.49
20.00	2.14	2.79	3.49	3.73	3.94	4.28	4.92	5.65
19.00	2.24	2.91	3.63	3.88	4.10	4.45	5.11	5.86
18.00	2.42	3.11	3.86	4.12	4.34	4.71	5.39	6.17
17.00	2.68	3.43	4.23	4.50	4.75	5.14	5.87	6.71

NOTES:

The above GMT values are based on a formula from the U.S. Coast Guard Regulations Section 46 CFR 170.170, Weather Criterion for Stability of Inspected Vessels. They are intended to limit the ship's static heel to the lesser of 14 degrees or one-half the freeboard if exposed to a beam wind of approximately 60 m.p.h.

These GMT are net amounts after the deduction for free surface.

These requirements exceed dynamic stability and damage stability requirements.

Assumed heghts:

20' Containers:	8' - 6"
40' Containers:	9' - 6"
45' Containers:	9' - 6"
48' Containers:	9' - 6 1/2"
53' Containers:	9' - 6 1/2"

Office of Marine Safety
Transcript Errata

Matter: El Faro
Ref #: DCA16MM001

Mr. Schilling:

Enclosed with this letter is a copy of the transcript of the co-interview of yourself and Mr. Van Rynbach taken on 1/28/2016. Kindly review this transcript for accuracy and provide corrections, if any, in the attached table.

Thank you in advance for your attention to this matter.

2/8/2016
Date

Eric Stolzenberg
Major Marine Accident Investigator

TABLE OF CORRECTIONS TO TRANSCRIPT OF INTERVIEW FOR

TABLE OF CORRECTIONS TO TRANSCRIPT OF INTERVIEW FOR

Spencer Schilling and Eugene Van Rynbach

TAKEN ON

January 28, 2016

PAGE NUMBER	LINE NUMBER	CURRENT WORDING	CORRECTED WORDING
8	9	David J.C. Moore	David J. Seymour
11	21	Intact damage stability	Intact and damage stability
15	2	It shouldn't replicate	It should replicate
17	13	Bending sheer force	Bending moment and shear force
27	24	(inaudible)	deadweight
31	13	ABS Group	Transcribed correctly, but the actual ownership is by "American Bureau of Shipping" – the Classification side of ABS
32	25	GLMV	GL-DNV
45	5	dead surveyor	deadweight survey
45	13	significant	insignificant
50	17	they're	they were
51	8	row-row	RoRo
51	19	we were coming on line	which were coming on line.
59	21	row-row	RoRo
62	9	keels	heels
64	9	closure in compliance	closing appliance
66	13	MR.	MS. (throughout)
66	17-18	air holes	cargo holds
66	20	Holes	holds
68-69	25-1	buoyance here	buoyancy
72	10	preboard	freeboard
75	20	(inaudible)	heel
81	12	row-row to row-load	RoRo to RoLo
83	5,8	row-row	RoRo
83	17	tended	intended
84	18	insulated	installation
91	16	interpellating (this has a separate definition)	interpolating
91	18	interpellate	interpolate
91	21	"	"
92	2	"	"
92	15	"	"
92	18	"	"
92	20	"	"
95	22	writing	righting
93	9	interpellation	interpolation
93	17	interpellating	interpolating
93	25	of is	of it is
96	3, 24	writing	Righting
97	1	writing	righting
99	17,20,24	IOM	IMO
100	16	extensive	extents of
103	13	Loading ships	Loading instrument

104	17	(inaudible)	??
105	21-22	May have an increase in safety level too much	May not have increased safety level too much
108	2	Manson	Matson
111	21	braking (Phonetic)	breaking strength
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113	1	rollout box	ro-locs
113	13,16	row-row	RoRo
113	19	roll lock	ro-loc
114	22	row-row	RoRo
115	10	row-row	ro-ro
116	3	Whole	Hull
128	3	row-row	ro-ro
131	1	concurred	concurrent
133	11	(inaudible)	to add and deduct.
133	18	interpellations	interpolations
133	18	freeboarding interpellations	freeboard interpolations
135	6	cables	tables
137	24	keep	keel
138	3	(inaudible)	condition
139	13	with a one percent	within one percent
139	22	uses hydro displacement	uses only displacement
142	5	(inaudible)	??(Spencer)
143	10-11	Mr. France	Most likely Mr. Stettler, not Ms. France
145	12	times	tons
147	17	or	you
147	19	(inaudible)	girder
147	19	modules	modulus
147	22	(inaudible)	FEA?
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153	22	Scanning	Scantling
154	5	Scattling	Scantling
155	15	(inaudible)	??
155	23	(inaudible)	Fire
160	8	module	modulus
“	6-9	Mr. France	Mr. Van Rynbach:
160	8-9	section module strengthened in	section modulus strength at

162	10	DNV, Lloyds, Reno	DNV, Lloyds, RINA
162	16	size	society
162	24	IX	IACS
163	6	Inaudible	still
163	16	GMLS	longitudinals

If, to the best of your knowledge, no corrections are needed kindly circle the statement “no corrections needed” and initial in the space provided.

NO CORRECTIONS NEED. _____
Initials

Eugene Van Rynbach
_____
Printed Name of Person providing the above information

[redacted]

_____
Signature of Person providing the above information

Spencer Schilling
_____
Printed Name of Person providing the above information

[redacted]

_____
Signature of Person providing the above information

__February 26, 2016_____
Date